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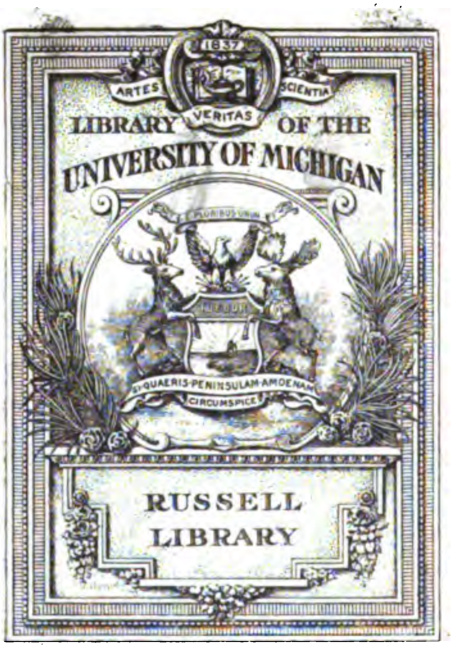

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GEOLOGICAL SURVEY

93

—OF—

ALABAMA,

EUGENE ALLEN SMITH, PH. D., STATE GEOLOGIST.

—ON THE—

WARRIOR COAL FIELD,

—BY—

HENRY McCALLEY, A. M., C. & M. E.,

CHEMIST AND ASSISTANT STATE GEOLOGIST.

MONTGOMERY, ALA.:
BARRETT & CO., STATE PRINTERS AND BINDERS.
1886.

LETTER OF TRANSMITTAL.

To His Excellency,
E. A. O'Neal, Governor of Alabama:

SIR:—The greater part of the present Report was submitted to the Legislature of 1883-4, and was ready for the printers early in 1884.

The manuscript was, however, lost in going by Express from Birmingham to Tuscaloosa. This necessitated the rewriting of the whole report, but the delay thus caused has enabled Mr. McCalley to add the results of an other season's work, by which the value and completeness of the Report have been very much enhanced. In its present form, it is believed that the Report contains a notice of every outcrop or exposure of coal known as occurring in the counties to which it relates, up to the date of the last field work, i. e. the autumn of 1885.

It has been my intention to add, as Part II, a Report upon the Cretaceous and Tertiary strata of the State in the vicinity of the Alabama and Tombigby rivers, with a full account and with analyses of the phosphatic and other marls of those formations. The investigations in this field were begun in 1883, at the joint expense of the United States and Alabama Geological Surveys, and the engraving of a large number of maps, sections, etc., necessary to the full understanding of the text, has been taken in hand by the United States Survey with the agreement that they shall be placed also at the disposal of the State Survey. Much to my regret, the engravings are not yet ready, and it has been deemed best not to delay the publication of Mr. McCalley's Report by longer waiting.

The Report on the Cretaceous and Tertiary will therefore be presented later.

The following are the names of those who have been engaged upon the work of the Survey during the two years

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covered by the present report: Henry McCalley, Chemist and Assistant Geologist in the Laboratory and in the Warrior Coal Field; Joseph Squire, in the Cahaba Coal Field, a full report upon which he has now nearly ready for publication; A. M. Gibson, in the plateau region of the Warrior Field. A preliminary Report upon this field by Gen. Gibson appears in the present document. Frank Burns, in the plateau region of the Warrior Field, and in collecting; D. W. Langdon Jr., assistant in the Field and in the Laboratory, in examining the phosphatic marls, etc., of Central Alabama; John Daniel was also employed for a short time in the same field. The account of receipts and disbursements will show the compensation received by each of the gentlemen above named, as well as by others who have been employed as temporary assistants.

Mr. Truman H. Aldrich has devoted a good part of his time for the past two or three years to the collection and description of the Tertiary shells of the State. Not only has he done this without compensation, but he has also presented to the Survey the manuscript and printed plates of Bulletin No. 1, lately published. It is the intention of Mr. Aldrich to continue his contribution to this important subject.

I have also from Dr. Chas. Mohr, of Mobile, the promise of a report on the timbers, forage plants, and other vegetable formations of the State.

The United States Geological Survey, some of the benefits of whose hearty co-operation with the State Survey, have already been experienced, is at present engaged upon certain Topographical and Geological work in Alabama. All this work, which, on account of its expense, would be far beyond the reach of the State Survey with its present appropriations, will be freely placed at our disposal.

I have the honor to be, sir,

Yours most respectfully,

EUGENE A. SMITH.

University of Alabama, Oct. 1, 1886.

PREFATORY LETTER.

BIRMINGHAM, ALA., Aug. 1, 1886.

To Dr. E. A. Smith,

State Geologist:

SIR:—I herewith submit a report which embraces all of my work in the Warrior Coal Field during the years 1883, 1884 and 1885, with the exception of a comparatively little on the Coal Measures of Franklin, Lawrence, Morgan, Blount, Marshall, Jackson and Madison counties, that was done during the autumns of 1883 and 1884.

I do not claim for this report anything like completeness, but then I have tried to make it as full as the time and means at my command would permit of, and hence I have not hesitated to make use of any accessible information, for which, I hope, due credit has always been given in the proper places.

I have given first a general description of the size, divisions and structure of the Warrior Coal Field as a whole, with estimates of the total thickness of the strata and of the number and thickness of its coal seams. These estimates, in the general descriptions, of the total number and thickness of the coal seams are somewhat too small, as may be seen from those on page 413, under Tuscaloosa county. In these general remarks, the coals have been described as to their amount, value, quality and advantages, and statistics have been given to show the growth of the coal and coke industries in the State and more especially of those of the Warrior Field. The wealth of this field in its building and paving stones, and in its timber and *future possibilities*, is also here noted.

After the above general account of the Warrior Coal Field as a whole, I have taken up the counties of Marion, Winston, Cullman, Lamar, Fayette, Walker, Jefferson and Tuscaloosa, in the order here named, and treated them in detail as to their physical and geological characters.

In these county descriptions, I have given under each county, first a short sketch of its topography, etc., and then an enumeration of its Geological formations, followed by general concise statements descriptive of its different classes of strata, specially full in the case of the coals, then by a general section of its strata and lastly by *details.* These details consist principally of descriptions and sections of out-croppings, and in them I have attempted to give the localities of all the known actual out-crops of coals, and, so far as I have been able, I have referred these coal out-crops to their proper positions or seams in the *General Sections,* and have given analyses of average samples of their full thickness.

After the county details, I have inserted a description, by Gen. A. M. Gibson, of the "Raccoon Mountain Coal Field," or of that part of the *plateau* or *table land* region of the Warrior Coal Field lying between Brown's Valley on the north-west and Wills' Valley on the south-east.

Finally, I have collected together and tabulated the analyses occurring throughout the body of the report and have closed the report with a NOTE, explanatory of what I now believe to be two grave errors. The first of these supposed errors is in my "*General Section of the Strata above Drainage Level of the Coal Measures of the Warrior Field in Jefferson County,*" and to it the other, in my estimate of the area of the *Pratt Seam* in Jefferson county, is to be ascribed.

I desired and intended to write up for this report my unpublished notes on the Coal Measures of Franklin, Lawrence, Morgan, Blount, Marshall, Jackson and Madison counties, but I have not had the time. I had also hoped to publish with this report a map of the Warrior Coal Field, showing approximately the limits of the main coal seams, but, as stated by you, the means of the Geological Survey would not admit of it.

I had also desired and intended to end this report with a complete and full index of its contents, but in this too I have been disappointed for want of time.

To you and to the many who have assisted me in the prosecution of this work, I here extend my sincere thanks.

Very respectfully, HENRY MCCALLEY.

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ON THE

WARRIOR COAL FIELD.

I. INTRODUCTION.

The coal lands of Alabama are of the great coal basin of the Ohio or of the great Appalachian coal field, and are estimated at 8,660 square miles. They formed one connected field prior to the great Appalachian revolution when there was pushed up through them long narrow anticlinal ridges which have been denuded into the present well known anticlinal valleys, and thus this great field has been divided up into three more or less distinct parts. These parts were named by Prof. Tuomy, in 1849, the Warrior, the Cahaba and the Coosa coal fields respectively, from the names of the rivers which drain them. They are of very unequal size, the Warrior, with an area of 7,810 square miles, being nearly ten times as large as the other two combined and about two-thirds as large as the coal area of Great Britain. This Warrior field is the most northwestern of the three coal fields of Alabama, and, as we shall consider it in these introductory remarks, comprises all of the coal measures in Alabama northwest of the A. G. S. R. R., or all of those drained by the Warrior and Tennessee rivers. The greater part of this field, almost all of it away from the present railroad lines, has never received more than a surface examination, and though we have been over it thoroughly and examined its outcrops most carefully, we cannot speak from this merely superficial work with the same degree of confidence and exactness that we would like to and could, had we have seen the unexposed strata; still, we have seen enough from the exposed outcrops to know for a certainty that we have in the Warrior coal field one of the richest coal basins of this or any other country.

We cannot expect, from its size and complex nature, to know this field in our lifetime as well as those of Pennsylvania are now known, unless the appropriation to the State Geological survey is greatly increased or the work is paid for in some other way. We are very well aware that exaggerated statements with their subsequent deceptions are very injurious to all parties and things concerned, and hence we shall be most careful in all of our conjectures and estimations to be within rather than without what we really believe to be the true approximation. Our present figures are much greater than those heretofore given, but then our present knowledge of the field is much greater, and with this increased knowledge has come the belief that the measures and included coal seams of this field are much thicker and broader than heretofore imagined.

As a whole, the Warrior coal field is a broad shallow *tray-shape* depression, sloping towards the southwest, and with its southwest end covered by a newer formation and its southeast side especially, complicated by folds and fractures. As is the case with all of our Coal Measures, it is composed of a series of sandstones, conglomerates, shales, slates and coal seams, with some little limestone at several horizontal positions, but contains no thick beds of this last rock like the measures of Pennsylvania and other States. The thickest conglomerates are near the bottom and top of the series, and hence its coals might be said to belong mainly to the *inter-conglomerate measures.* The general dip of the strata is some few degrees to the southwest, and as this dip is greater than that of the inclination of the surface of the country, the measures thicken as you go to the southwest until they become covered by the *Drift.* In addition to this small angle of dip, which is characteristic of the Warrior coal field, when compared with the other coal fields of Alabama, the strata of the northwest side of the field have a general dip to the southeast, and those of the southeast side to the northwest, and thus the basin shape is given to the area. The strata of these two sides are also in long flat waves from northwest to southeast while those near the center of the basin are in similar waves from northeast to southwest.

This field has been conveniently and appropriately divided into a *plateau* and *basin* area, without any distinct line of demarkation between the two, the one gradually merging into the other.

The *plateau* or *table land* owes its existence to, and is composed principally of the hard weather-resisting conglomerates near the base of the measures, and, reckoned from the presence of these rocks as surface rocks, it comprises the elevated northeastern part of the field and a portion of the southeastern rim. It includes nearly one-half of the area of the field and is nothing more than the southwestern end of the Appalachain mountains as they gradually slope from an elevation of 800 feet above the general level of the country in the northeast corner of the State, until they sink below the drainage level or pass imperceptibly into the *basin.* This *plateau* or *table land* is divided into two unequal parts by Brown's Valley, which is the extension into Alabama of the Sequatchie Valley of Tennessee. That portion of it north of the Tennessee River is merely the terminal points and detached spurs of the Cumberland table land of Tennessee. It is well drained and is gently rolling, except along the water courses whose sides are generally rugged and steep. It has an elevation of from 600 feet to nearly 2,000 feet above the Gulf of Mexico, with a climate unsurpassed in salubrity; a mean annual temperature of about 58° F. and an annual rainfall of about 54 inches. It is still covered, for the most part, with its virgin forest, and its soil, as a general thing, is sandy and poor. Its coals are principally of the *sub-conglomerate* measures, which gradually become thinner and thinner as you go to the southwest. The coal seams also thin out in this same direction, and though they comprise, just before they come into Alabama, the thickest and best coals of the State of Tennessee, and in the extreme northern portion of Alabama sometimes reach a thickness of seven and eight feet, they, in this latter State, are too uncertain to be profitably worked.

The basin takes in the lower or southwest end and the greater half of the field. It is, as a general thing, more broken than *the plateau,* for the reason that it is composed principally of softer rocks which have suffered more from denudation. Its upper or northeastern part is made forked by the extending down into it between Big Warrior and Little Warrior Rivers, almost to their fork, the prolongation of Brown's Valley as an anticlinal ridge, and its southeastern edge has cut off from it, by a combined fold and fault, a strip which has received the name of *Little Basin.*

This *little basin* is also a *tray-shape* depression, running in the general direction of the anticlinal valleys, and is some twelve miles long by over three in width. Its upper or northeast end is concave and its southeast rim, Rock Mountain, as it consists of the hard conglomerate of the *plateau*, is much taller than its northwest border which is formed by an anticlinal fold with a fault along it. Along this fault there has been either an *up-throw* or upheaval of the southeastern or *little basin* side or a *down-throw* of the northwestern or *big basin* side. The probabilities favor the *up-throw* of the *little basin* side, though in previous articles, by the writer, the down-throw is said to have taken place.

The *basin* proper, or the *big basin*, above drainage level, is made up for the most part of shales and sandstones which have been piled up to a great thickness of successive strata upon the hard conglomerate of the *plateau.* This *basin* is rich in workable seams of coal which continue to increase in number as you go to the southwest, or as the measures thicken, until all the coal rocks become entirely covered by *Drift* at Tuscaloosa.

Tuscaloosa is at the present head waters of navigation of the Warrior River, and in the bed of the river just below the bridge is the most southwestern end of the great Appalachian coal field, so far as can be seen. Provided the strata retain the thickness of their outcrops, we believe that Tuscaloosa stands on the greatest thickness of coal measures in the known world, and a thickness of coal only secondary to that of West Virginia. These estimates take into account merely the additions from above, for, of course, we cannot tell what has happened to the *sub-conglomerate* measures, though several of their most western outcrops might lead one to infer that they, too, had grown in thickness. The measures as they become covered up at Tuscaloosa are believed to be, at the least, over 3,000 feet in thickness, with nearly 50 seams of coal of an aggregate thickness of nearly 100 feet of coal.

As in all coal measures, in these the same coal seam or stratum will sometimes vary and be quite different at two localities only a few miles apart, and hence it is frequently a very difficult matter to tell for a certainty, from merely the partial exposures, the identity of a coal seam or stratum with one seen several miles away, and hence our inability to speak in positive terms, as our surmises may be entirely wrong.

Though Alabama ranks only eighth in the Union in the acreage of its coal measures, it takes a front rank in the quantity and quality of its coal, and hence superficial area alone of a coal field is a very poor indication of the amount of coal which it contains and of its value, as the measures may be almost barren or the coal almost worthless.

The coal seams of the Warrior field range in thickness from a few inches to about fourteen feet, the thicker seams always containing more or less slate or clay as partings. Judged principally from partially exposed outcrops, there appear to be about thirty-five of these seams of coal of eighteen inches and over in thickness, and of these thirty-five there are about fifteen of two feet six inches and over, and of these fifteen there are six of four feet and over. These coal seams, however, seem to become thinner towards the northwest, or the coal outcrops on the northwest side are thinner, as a general thing, than those of the center and southeast side of *the basin.* This is doubtless due to the fact that this northwest side is the corresponding edge of the original great coal basin of Alabama, whereas the present southeast limits of this field ran through the central portion of the original basin, and were thrown up and washed out as limits after the coals had been deposited.

Provided all the coal seams of the Warrior field will average, throughout their whole extent, a thickness equivalent to that of their most accurate and reliable measurements, they will contain, we believe, a sum total of coal of not less than 113,119,000,000 tons, of which about 108,394,000,000 tons would be available coal or of the seams eighteen inches and over in thickness. These figures are simply enormous, and tell us, in plain black and white, that the available coal of the Warrior coal field is three times that of the estimated available bituminous and semi-bituminous coals of the great coal producing State of Pennsylvania, and that, if this coal was spread out evenly over the surface, it would cover the whole State of Alabama (52,250 square miles in extent) over two feet in thickness, and that, at the present rate of consumption of coals of all kinds, it would last the whole world over two hundred and seventy years.

This available coal, at the mouth of the mines, is worth $150,000,000,000, of which at least $30,000,000,000 is profit or net money. This net money is nearly two hundred times the total assessed value of property in the State of Alabama, and would about buy every foot of territory in Alabama at $900 per acre.

Suppose that from the thinning out of the seams and from various other causes, that only one-fourth of the above available coal can really be mined, even then this rich field will furnish enough coal to last nearly 15,000 years, with a daily out-put of 5,000 tons.

These coals, though all bituminous, are of many kinds and qualities; among them may be found good coking, blacksmithing, steam, gas and grate coals. Many of them are firm and bright, and would well bear transportation, while others are of a duller color and of a softer and more friable nature. The most of them, however, have been judged simply by their partial exposures in the weathered out-crops, and have never had applied to them the only sure test of actual use on a large scale and in various operations. Nearly all of them contain more or less mineral charcoal in thin sheets along the planes of stratification, and many of them have a very high percentage of carbon with but very little ash and clinker.

The following analyses of three representative coals of this field with that of the Connellville coal, will serve to show the quality of these coals, and for comparison with the Connellville coal:

	Pratt.	New Castle.	Black Creek.	Connellville.
Specific Gravity......	1.299	1.33	1.36	....
Sulphur........	1.041	.64	.10	.06
Moisture.............	1.025	.50	.12	1.20
Volatile Matter......	32.169	28.24	26.11	28 50
Fixed Cardon.......	63.370	59.69	71.64	64 12
Ash.......	3.342	10.92	2.93	6 12

The above analysis of the Pratt coal is the average of five analyses made by three different analysts, that of the New Castle is by Dr. Otto Wuth, of Pennsylvania, that of the Black Creek is by Dr. Wm. Gesner, of Alabama, and that of the Connellville is one of the latest made of this celebrated coking coal. The Pratt, New Castle and Black Creek coals, are truly representative coals of the Warrior coal field, for they are found respectively in the upper, central and lower part of these measures. They are all good coking coals and lose nothing from a comparison of composition with the Connellville coal. The Pratt, of these three coals, is most similar to the Connellville coal, in both physical and chemical properties, though it is a purer coal. It is likely just as good a coking and iron smelting coal as the Connellville, without the reputation of the latter. This Pratt coal is a compact, lustrous and usually very black coal. Its seam will average about four feet in thickness. The New Castle coal is a firm, bright and free burning coal. It bears transportation well and has a great future; the only objection to it being that it is hard to mine clean from the presence of partings in the coal. Its seam will average seven feet in thickness. The Black Creek coal is a firm block coal of a dull luster. It is believed to be the purest and most uniform in thickness and composition of any coal in Alabama. It is a fine black-smithing, steam and gas coal, and the only objection that can be urged against it, is that its seam is not quite thick enough for cheap mining, being only about two feet six inches thick.

Chemical analyses will show the compositions of coals, but, as their true values and fitness for particular purposes are largely dependent on physical properties, the best test of their worth is actual experiment or use on a large scale, and hence the following table is appended to show the standing of some Alabama coals as compared with well known coals of other States, for heating or steaming purposes:

NAME OF COAL.	Pounds of water evaporated from and at 212° per lb. of coal.	Per cent of non-combustible from combustion under boiler.	Rel'tive heating or steaming values. Cumberland, Md., being 100.	NAME OF STATE.
Cumberland	8.21	11.5	100.0	Maryland.
Pratt	8.04	7 4	97.9	Alabama.
Jellico......	7.45	6.3	90.7	Tennessee.
Pittsburg. ..	7.63	7.4	92.9	Pennsylv'nia
Altmont.....	7.41	3.5	90 3	Kentucky.
St. Bernard.	6.73	6.9	82.0	Kentucky.
Warrior	7.73	4 6	94.2	Alabama.
Helena. ...	7.58	7.7	92.3	Alabama.
Watt........	7.11	13.2	86.6	Alabama.
Diamond ...	6 20	10.2	75.5	Kentucky.
Mud River. .	6.89	4.6	83.9	Illinois.
Memphis ...	6.45	8.5	78.6	Kentucky.
Clifton. ..	5.74	14.6	69.9	Kentucky.
Sewannee...	7.37	11.3	89.8	Tennessee.
Cahaba. ...	7.65	5.0	93.2	Alabama.
Blocton.....	7.37	5.7	89.8	Alabama.
Black Creek.	7.63	4.0	92.9	Alabama.
Henry Ellen.	7.25	5.2	88 3	Alabama.
Daisy.	7.16	11.4	87.2	Tennessee.

The above table is an abstract of the results of tests made by Prof. O. H. Landreth, at Vanderbilt University, Nashville, Tennessee, between March 12th and May 2d, 1885. In these tests, ten tons of coal from each mine were used, and, in case of the Alabama coals, we have been told that some of them, at least, were not picked coals or were not intended for this purpose, but were taken from their regular marketable screened products. These tests show up the Alabama coals in a most favorable light, and demonstrate that one-half of those tested were excelled for steaming purposes by only the Cumberland coal, and that the lowest one on the graded list was superior for these purposes to several of the coals brought from other States. Four of these Alabama coals, namely: the Pratt, the Warrior, the Watt, and the Black Creek, were from the Warrior field, the other four were from the Cahaba field.

In estimating the economical values of any coals, we should constantly bear in mind the ease and cheapness with which they can be mined, and can be now, and in the near future, placed upon the market.

The cost of mining will, of course, vary for the same seam according to the kind of labor, machinery, etc., etc., employed and for different seams according to thickness, amount of interbedded slate, nature of roof and other conditions of a practical nature. We believe, however, that, on an average, the coals of the Warrior field can be mined just as easily and cheaply as those of any other country, for the reason that, as a general thing, the physical features of the measures, the small angle of dip and the structure of the coals, are all favorable to cheap mining. These physical features of the country will enable good workable seams of coal to be found in nearly all parts of the productive measures at moderate depths below the surface, and, in nearly all cases, will permit of their being reached by drifts and slopes; and the small angle of dip of the coal seams is much better adapted to cheap mining than if the seams were perfectly level, as it frequently gives a natural drainage, and will, in all cases, permit of the mines being kept dry at comparatively small cost. The hard solid roofs, the soft underbeds. and the *face and butt structure* of most of these coals are also conducive to cheap mining, and the greatest hinderance that any of them have to cheap mining is that the thicker seams always have interbedded in their coals more or less slate. The slate of these thin strata in the coal in some cases, as in the New Castle coal, can not be mined out cleanly, and, of course, in these instances, is a great draw-back to the coal, and is very injurious to its quality. There is only one practical way of completely getting rid of this slate in thin sheets in the coal, and that is by washing, which entails an additional expense on the mining of these slaty seams.

Cheap transportation is indispensable to cheap coal, and that coal field which can furnish the market with the cheapest coal, taking quality into account, is sure to win in the great struggle for precedence.

The Warrior coal field has now touching upon its productive area three "great trunk" railroad lines, and the certainty of being penetrated in the near future by several other lines. The L. & N. R. R. crosses it on the east, the A. G. S. R. R. bounds it on the southeast, the G. P. R. R. enters it on the east and west with a gap of only forty miles, now partly under contract, to be completed; and the B. & S. R. R., and K. C. & B. R. R., now being built, will soon quarter it.

Far better than all of these railroads, it has winding through its basin from northeast to southwest a river length within the basin of nearly 100 miles, which can be made navigable for steam tugs and coal barges all the year round, with a minimum channel, at extreme low water, of 80 feet wide by 4 feet deep, for the sum of from $400,000 to $1,200,000, according to the nature of the work.

Appreciating the great advantages of cheap or water transportation for all heavy freight, such as coal, iron, lumber, etc., etc., and the great importance of our water ways from the fact that they run through the centers of our best coal and timber lands, the Birmingham *Daily Age* suggested, some six months ago, the calling of a river and harbor improvement convention at Tuscaloosa, Alabama. This convention, consisting of more than 200 representative business men from Alabama and adjoining States, assembled in Tuscaloosa on the 17th of last November, and as one of the acts of their proceedings, memorialized Congress to appropriate a sum of money sufficient to complete at an early day the deepening of the harbor of Mobile to at least 23 feet, and the improvement of the water ways of Alabama and their tributaries. Cheap coal is of national importance, and Congress will doubtless soon recognize it as such, and then there will be opened a water way to the sea for the cheap coal of the Warrior field as prayed for by the Tuscaloosa convention. When this shall have been done, the cheap coal of the Warrior field will be loaded on ocean steamers at Mobile, and will fear no competition in the ports of the Gulf of Mexico and South Atlantic.

The coals of this field, in common with those of the other fields of Alabama, are rendered especially valuable from their proximity to the vast deposits of red and brown iron ores and limestones of the long, narrow anticlinal valleys which separate these fields, and which have along them such a development and juxtaposition of the raw materials for the smelting of iron ores on a large scale as is nowhere else to be seen.

Coal mining in Alabama is growing rapidly, and, though just out of its swaddling clothes, has already assumed greater proportions than that of any other Southern State, and will soon, likely, take a rank next to Pennsylvania. The mines are all close to the present lines of transportation, and on the outcrops of coals near the edge of the productive area. They include among them some of the richest, if not the richest, bituminous coal plants on the face of the globe. The progress of coal mining in the State for the last fifteen years, is represented by the following figures:

In 1870	11,000	tons.
1873	40,000	"
1876	100,000	"
1879	250,000	"
1882	800,000	"
1885	2,225,000	"

The coal mined in Alabama during the year 1885, was, therefore, worth, at $1.40 per ton, $3,115,000, of which about $623,000 was net money. About six-sevenths of this output was from the Warrior field, and about four-fifths of it was consumed by the furnaces and railroads of the State.

In keeping with this rapid growth of the coal production, is that of the coke industry of the State. This industry, though less than eight years old, is the next to the greatest of its kind in the world, and unless Pennsylvania looks well to her laurels in this respect, there will be danger, in a few years, of their being usurped by this southern power. The growth of the coke industry in Alabama for the last six years is indicated by the following figures:

In 1880	60,781 tons.
1881	109,033 "
1882	152,940 "
1883	217,531 "
1884	244,099 "
1885	304,509 "

This coke, as a general thing, is of excellent quality for both iron ore smelting and foundry uses, and with the exception of a very small percentage was made from coals of the Warrior field. About all of this output was consumed in the State. It is worth about $2.75 per ton, which would give a value of $837,399 to the product for the year 1885.

The Warrior coal field has besides its coal three or four seams of *black band iron ore*, considerable *clay iron stone*, inexhaustible quarries of the best of building and paving stones, and the greatest quantity of as fine timber as can be found anywhere.

The seams of *black band ore* range in thickness from one foot to four feet, and the ore from two of the seams has been tested, in the furnace, with favorable results when mixed with more siliceous ores. The *clay iron stone* occurs as interstratified bands and as layers of nodules, balls and *kidney-shape* concretions, dispersed through the thick beds of shale. The building stones are easily worked and are of a good variety and durability. The paving stones are of all degrees of thickness and of great uniformity with perfectly smooth and beautifully rippled marked sides. These paving stones, from their great regularity, in certain localities have been called *plank rocks*, and appear, as seen in the faces of many of the quarries, as if they had been piled up on one another by rule like the rows of bricks in a brick wall. The larger timber consists principally of long and short leaf pine, oak, gum, beech, poplar and cypress. This long leaf pine, in certain parts of the field, forms forests which will yield from 18,000 to 20,000 feet of good merchantable lumber per acre, and the oaks, gum, beech, poplar and cypress grow, along most of the water courses, to be of enormous size.

The Warrior coal field also presents along its streams some of the grandest and most picturesque of scenery and innumerable sites for the erection of machinery of any magnitude up to that of 100 horse power.

This field has, therefore, great possibilities, for it has the cheap power of both steam and water, which is the most important element of all manufacturing and commercial enterprises, and which will inevitably draw to this locality cheap factories and diversified industries, the harbingers of future greatness and wealth.

We predict a day, not very far in the future, when the Warrior Coal Field will be recognized the world over as one of the richest and most important of all mining districts, and when its coal and coal industries will be the chief factors in the prosperity of a great and growing State.

NOTE.—The above introduction is almost a *verbatim et literatim* copy of an article by the author, which appeared in the April and May numbers of the periodical *Dixie*, published in Atlanta, Ga.

II. COUNTY DETAILS.

1. MARION COUNTY.

The topographical features and geological structure of this county have already been briefly described by the State Geologist in his reports for 1877–1878 and 1881–1882. Like most of the mountainous counties of Alabama, it is, as yet, rather thinly settled, especially over the high-lands which make up, at the least, eleven-twelfth of the whole. It was computed to have by the census of 1880 a population of only 9,364, and an area of 518,400 acres, or more than fifty-five acres to every soul. It has a mean annual temperature of about 60° F., and a yearly rainfall of over 52 inches. It is well watered and drained and would be, with railroad facilities, a desirable county in which to live.

TOPOGRAPHY, ETC.

The topographical features are merely great irregularities of surface, which have been produced entirely by erosion, and hence they now bear a strict relationship to the geological formations, or are varied in proportion to the different degrees of hardness of the many strata and the wasting agencies to which these strata have been exposed. The county, as a whole, being a net-work of deeply eroded channels, can with propriety be termed broken, though there are, between the main water courses, high and wide divide or table lands with comparatively level tops. From these principal water sheds or divides, there stretch out great fingers or smaller divides between the tributaries to the main water courses. The surface of the eastern half of the county is much more ragged or the irregularities are much sharper, more abrupt, sudden and marked than in the western half, for the reason that all the streams of the eastern half have cut down into the hard, weather resisting sandstones and conglomerates of the coal measures, whereas, in the western half, the only formation to be seen is the comparatively soft overlying *Drift.* For the same reasons the streams of the eastern half are confined for the most part to deep narrow channels and have rapid currents, while those of the western half usually meander from side to side of the comparatively shallow and broad valleys and have very little fall and hence *lazy* or eddy like currents. Those of the eastern half may be said to have no first and but little second bottom lands, as they rush with great swiftness and gurgle with great noise, deep down between precipitous bluffs and over rough rocky bottoms, with frequently, along them, only massive sandstones and conglomerates here, there, and every-where to be seen; while those of the western half have usually wide first and second bottoms, and frequently cover the former, as they gently and quietly flow between low earthy banks and over smooth pebbly beds with nowhere along them a massive rock to be seen. Along the beds and steep embankments of the former, there often lie scattered loose boulders, *house-size* in dimensions, which add much to the grandness, wildness, and picturesqueness of the scenery, while, over the low, flat, first bottoms of the latter, there are not unusually long stretches of placid water, lake-like in appearance, which mellows the scenes and makes them pleasing and beautiful to the eye.

The larger streams of the eastern half of the county are some 200 feet below the general level of the country, while those of the western half, as a general thing, are not more than 100 feet. Near the heads of these main streams of the eastern half of the county and along their numerous tributaries, there are nearly always deep, dark, wild looking gulfs which are surrounded on three sides by high, perpendicular bluffs, that are usually overhanging and crescent in shape around the heads of the ravines, where the small streams have clear leaps of from 30 feet to 50 feet. In these bluffs, almost invariably under their crescent portions around the heads of the ravines, there are numerous *rock-houses*, from a few feet in dimensions to hundreds of feet in length and forty to fifty feet in depth and height. These *rock-houses* commonly occur along the base of the bluffs, though occasionally they are seen mid-way up in the bluffs, when oftentimes they can be reached only by ladders or their substitutes. With their wide, gaping mouths in the faces of the bluffs, they, especially when high up, give a strange and grotesque appearance to the looks of things. Many of these *rock-houses* have served as burial places for a former race of people and as homes for refugees and criminals of the present day. Those high up in the bluffs are also inhabited by the wild birds of the forest, in which they build their nests and raise their young. These *rock-houses*, when low down, frequently contain bold and lasting springs of excellent water, and, when convenient, are held in high repute as *spring-houses* and as places of safety in times of storms.

Soils.—Nearly all of the soils of this county as they have been derived from the sands and sandy loams of the *Drift*, and from the sandstones and sandy shales of the *Coal Measures*, are more or less of a sandy nature, though there are areas of no mean extent of a stiff clayey soil which has come chiefly from the disintegration of the clays of the *Drift* and the argillaceous shales of the *Coal Measures*. By far the most abundant soil in the county, or the one that covers, at the least, nine-tenths of the surface area of the county, is of a fine silicious texture and of a light ashy color. It is derived principally from the weathering of sandy materials of the Drift though partly of the Coal Measures. It is the soil of the post oak and black-jack crowned ridges, or the principal soil of the high-lands, and has been pronounced, in a great many places, to be too poor to cultivate; i. e., in cotton and corn, though it naturally brings the finest and best of fruits, vegetables and grasses and would doubtless do much better after light applications of a lime compost. It sometimes, when of Drift origin, has a red sandy loam subsoil and is regarded as being fertile, and occasionally goes by the name of *cucumber lands.* Of these high lands or of the tops of the broad and high divides, there is also a red sandy loam with a substratum of rounded gravels; it is of the Drift and is of very irregular areas; it covers some of the loftiest points or forms many of the knolls and small ridges on the tops of the divides. There is also on the divides, in the eastern part of the county, a dark gray soil of a gravelly nature from the presence of small angular fragments of the underlying sandy shales of the Coal Measures; it occurs principally in strips of comparatively low positions. Both of these last named soils grow very good crops. The greatest objection to and trouble with these productive soils of the high ridges and divides, is that they easily wash away, being of necessity of sideling or rolling areas. They seem, however, to wash much less when of a gravelly than when of a clayey nature.

The principal and best farming lands of this county are composed of a very sandy loam, usually of a light or yellowish color, though occasionally they are reddish and sometimes gravelly. They form the greater part of the second bottoms to the larger streams and the narrow bottoms along the smaller creeks and branches. They are principally of the western half of the county or of the Drift, and when of the Drift, they usually have a sub-stratum of rounded pebbles, which keeps the soil well drained and thus improves its fertility. When constituting the second bottoms, these lands generally lie beautifully and, in the western half of the county, are often near a mile in width. They are easily cultivated and produce finely; improving on simple cultivation, provided they are not badly abused. Some of these Drift soils of the second bottoms are said now, after fifty years in cultivation without ever having received a single drop of fertilizer of any kind, to yield three hundred and fifty pounds of lint cotton to the acre. When of the Coal Measures, these lands are not near so regular or so abundant as when of the Drift; they occur in smaller bodies or patches, and, of course, they do not possess the under-stratum of rounded pebbles, though they are often gravelly from the presence of small fragments of the underlying sandy shales or shaly sandstones. These soils also, as a general thing, when of the Coal Measures, appear to be somewhat shallower and more sandy and of a lighter color, and do not seem to produce altogether as well as when of the Drift, though they do bring good crops. These sandy lands, after they have been worn out and washed into gullies and turned out into old fields, nearly always, at first, grow up in sedge grass, which in a few years gives away to thickets of short leaf pine and never the original growth of oak, hickory, etc. These pines are a great blessing to this country, for they are the great resuscitators of the dead sandy soils. They, by means of their roots and straw, fill up the gullies and enrich the soil, and in fifteen to twenty years, will bring back these worn out soils to their original fertility of producing some forty bushels of corn to the acre. They, in this time, will have become twelve and fourteen inches in diameter, or more than large enough to furnish timber sufficient to refence the now *new ground.* Should these pines by any means be killed, as by fires or worms, the next growth is usually *blackberry* briers, which is also a great fertilizer.

Bordering upon some of the wide second bottoms of the streams of the Drift, there is occasionally to be seen a low flat broad ridge of a deep red sandy loam with an underbed of rounded pebbles.

The clayey soils, as already stated, are derived from both the Drift and the Coal Measures, and do not cover, comparatively speaking, a very great area. Those from the Drift are principally of strata either near the top or bottom of the formation; when near the top of the Drift, they are generally of a red color, and are very seldom of a stiff nature, as they are nearly always mixed with more or less sand, but, when near the bottom of the Drift, they are generally plastic, sticky and of a light color, and are much purer clays than those at the top of the formation. The true clayey soils of the Drift in Marion county are not, however, of such an extent as to be of any great consequence. The clayey soils of the Coal Measures in this county are nearly all derived from the argillaceous shales, and occupy usually a rather low position, as they are found mostly on the slants and second bottoms. They are of a light gray and bluish color, and sometimes are in bodies of considerable extent. They are waxy when wet and hard when dry, and are therefore hard to cultivate; they are also drouthy, and are not at all fertile.

Along the principal streams where the Drift has not been cut through, as along Sipsey and Luxapolila Rivers, the first bottoms are, as a general thing, very wide, and sometimes reach more than a mile in width. These first bottoms are low, flat, marshy and swampy, and are, for the most part, still covered by their virgin forests of large growth, for the reason that their porous sandy soil of a light color, or their *crawfishy soil,* is considered of no agricultural value, or will produce nothing, after the first few years' cultivation, or after all the roots have been plowed out of it. Were this soil ever so fertile, it would not be of much worth, for it always appears to be either too wet and soft or too dry and hard for cultivation. There are, however, some high spots in these first bottoms, which do not overflow, and which have a soil very similar to that of the second bottoms with their well known productiveness. There are also in these first bottoms dense reed brakes of twenty-five and thirty acres in area, which have a deep black soil, that is the accumulated washings of the hills around for a great many years. This black humus, if it could be drained, would doubtless bring very fine crops. One of the peculiar sights of these first bottoms is the *cypress knees* which stick up in clusters like the snags of old stumps.

Water.—There is perhaps no county in the State that is better watered than Marion county. Its principal streams never stop running, for the simple reason that they are fed mainly by perpetual springs. These springs rise chiefly in the pebbles and the sands of the Drift, and hence they are most common along the sides and near the base of the ridges and divides of these materials. The water is generally a pure freestone, though bold and lasting *chalybeate springs* of perfectly clear water, are numerous in nearly all parts of the county. Some of these chalybeate springs are strongly impregnated with iron, and are known beyond the county as health resorts during the summer months. The only localities in the county which are known to be scarce of good drinking water, are the comparatively small patches which cover the out-crops of the argillaceous shales of the Coal Measures.

The river, creeks and branches of the central and eastern part of this county, are singularly well suited for the erection of mills and such like, for many of them not only always have plenty of water, but they also have a great fall, narrow channels, and rocky bottoms and sides. The streams of the western half of the county, though they contain more water, do not suit near so well for such purposes, as they are much wider and have lower banks and less fall, and no solid rocks on which to plant and fasten the dams and machinery. For the above reasons, mills are scarce in the western half of the county, where the dams have to be built out of brush and gravels and over piles which have been driven down to a stratum of gravels to keep craw-fish from undermining the dams.

Forests.—The native forest of the different kinds of oak, hickory and short-leaf pine, and sweet-gum, chestnut, black-jack, beech, poplar, cypress, black and white walnut, persimmon, spruce pine, etc., still covers more than nine-tenths of this county. Over the high lands, or over the ridges and divides, as a whole, the principal growth consists of post-oaks and black-jacks, though the other oaks, hickories, short-leaf pines, chestnut and black-gum, are in great quantities and compose the largest growth, and in spots are the main growth of these high lands. Some of the ridges, however, are covered with a growth almost entirely of post-oaks and black-jacks, and hence the name *post-oak and black-jack ridge* has been applied to them. In the bottoms and hollows, the red-oak, the sweet-gum, the short-leaf pine, the poplar, cypress, and beech, grow to be as large as anywhere in the State. The chestnut is rapidly dying out, it is supposed from the annual burning off of the forests, and the cypress is becoming scarce from its great use for boards, so that in a few years, if there is no change, these two valuable trees will have become extinct. The forests of this county have been very much mutilated by the cyclones of the last few years, and the two cyclones alone of April 1883 and 1884, doubtless destroyed in this county more than enough good hard timber to have rebuilt every house and pannel of fence in the county.

GEOLOGICAL FORMATIONS.

The surface geology of Marion county consists of only two formations: (1) *Coal Measures*, (2) *Stratified Drift.*

1. COAL MEASURES.

These measures, though the uppermost and newest of the older formations, comprise the lowest and oldest of the surface rocks in this county. They are of the north-western extremity of the Warrior coal field or are the most western of the Coal Measures in the State, and are confined principally to narrow strips along the streams of the eastern half of the county and may be said therefore to occupy topographically low positions. They form something less than one-fourth of the surface area of the county, or not quite two hundred square miles. It will be a long time, if ever, before their western limit is accurately known, as it is covered by a thick deposit of unconformable stratified Drift. They show along Bull Mountain creek, in the northwestern corner of the county, to within less than three miles of the Mississippi line, and along Buttahatchee River down into Lamar county, but no where west of the Buttahatchee off of Bull Mountain. They are in broad and flat waves, and have many local wrinkles and false beddings, and perhaps faults. The strata have two general dips of 6° to 8°, one of which is to the southwest and the other is to the southeast, besides they have many local dips, which reach as high as 15° to 20°, of waves and wrinkles whose axes always point to the northwest and southeast or are at right angle to those of the great anticlinal folds of the State. The strata are also very variable as to thickness and composition, and many of them possess a great resemblance to each other, and so it is often a very difficult matter to recognize, with any degree of certainty, any one of them, from the merely partially exposed outcrops, at intervals widely separated. The measures, however, as a whole, thin out towards the north and northwest or thicken towards the south and southeast, notwithstanding that they or the surface of the country, become higher and higher towards the north or lower and lower towards the south. Provided the different strata remain the same throughout in number and thickness as are their exposed outcrops in this and the adjoining counties, we believe the Coal Measures of Marion county will have a minimum thickness of less than fifty feet, in the northwestern part of the county where they disappear beneath the overlying *Drift* on Bull Mountain creek, and a maximum thickness of more than 1,200 feet, in the southeastern corner of the county. They are also thought to be about 500 feet thick near Allen's Factory on Big Bear creek, in the northeastern part of the county, and over 700 feet thick in the southwestern part of the county where they enter Lamar county along the Buttahatchee River.

The topography of the country and the above general dips and thickening of the strata, as a whole, seem to indiçate the fact that these measures are on the northwest edge of a *scoop shape* depression. They, as do all of the Coal Measures of Alabama, consist of a series of alternating strata of, (1) *Sandstones, Conglomerates;* (2) *Shales, Slates;* (3) *Clays;* (4) *Stone Coal.*

(1) *Sandstones, Conglomerates.*—These are by far the most highly developed of all the above materials and make up much the greater part of the Coal Measures of Marion county. They are the massive, hard, weather resisting rocks which cause all the sudden jump offs or ragged appearance of the country, and which give to the topographical features all of their grandness, wildness and picturesqueness. They occur or crop out as high perpendicular and overhanging bluffs along the creeks and gulfs, and it is no unusual thing to see them presenting bold and naked faces of fifty and sixty feet, and, occasionally, of nearly two hundred feet in thickness. They are by no means regularly stratified; some of their bluffs in one place will appear as an almost solid

rock from bottom to top, while in an other place they are cut up by parallel horizontal planes of stratification. They are also frequently cut up by parallel perpendicular planes of division which are ten and twelve feet apart, and, occasionally, by two sets of these planes, at right angles to each other. These perpendicular planes had, so far as noticed, one of two general directions; they were pointing either to the north-east and south-west, or to the north-west and south-east. These rocks are massive, flaggy, slabby and shaly in structure; coarse and fine grain in texture; soft and hard; friable and compact; and light, yellowish, grayish, pinkish and reddish in color. They are very variable, and are often seen to change from one to another of these kinds within a short distance. Some of them harden on exposure, while others become a loose mass of sharp grains of sand, which is well suited for mortars. The conglomerates are only of the massive kind. They contain smooth and well rounded flint pebbles which are of a clear and milky color and are seldom larger than an ordinary bean. These small pebbles in the weathering of the conglomerates, are sometimes seen standing on little columns, an inch or so high, which they have protected from destruction as the rest of the massive rocks have been worn away to this extent. The conglomerates were seen in only two bluffs or horizontal positions, as believed, though they are thought to occur along Bull Mountain creek, above drainage level, at a third and lower position than either of the above. See (1) under *General Section.* The pebbles were not so much confined to streaks 'but were more universally distributed throughout the massive rocks of these bluffs than they usually are in the conglomerates of our Coal Measures. In some instances these pebbles were so few that these conglomerates might well be termed sandstones, and, again, the massive sandstones were often the perfect images of the conglomerates less the pebbles. These massive sandstones are seen most commonly near the tops and forming the capping stones to the bluffs, and are frequently very hard and fine grain, and of a light gray color. They often split or work with equal ease in any direction, and make beautiful and durable building stones. They, especially over the naked faces of the bluffs, are frequently partly covered with a coating, one-half an inch or more thick, of hydric ferric oxide which protects the parts covered and thus causes the rocks to weather out into honey-comb or spongy looking masses, whose cells or holes are themselves often determined in both size and shape by a similar shell or coating of the iron oxide. The slabby and flaggy sandstones are exposed the best, generally along near the bottoms of the bluffs and along the beds of the creeks and branches, though they frequently show plainly as seams up in the bluffs between the massive sandstones and on the hillsides as thick partings in the thick beds of shales. They are the rocks which contain the false beddings and in which the local waves and wrinkles are plainest. These waves and wrinkles are especially plain in the decapitated folds along the beds of the creeks and branches. The flagstones are frequently of the very best quality. They are from an inch to a foot in thickness, and have perfectly smooth or beautifully rippled marked sides, and need only to be squared to be ready for their many uses. Many of them have a fine coarse grit and make excellent whetstones and grindstones for common edge tools. The only uses to which they have been put, as yet, are for building chimneys, steps and foundation walls and pillars for houses, and for head and foot stones and coverings for graves.

These flaggy and slabby rocks are the softer rocks in which nature has chiefly chiseled out her *rock-houses*, under covers and sometimes over floors of the massive sandstones. Nearly all of these *rock-houses* contain earthy deposits of copperas and alum, with which salts the clear and cool waters of the free flowing and lasting springs of these *rock-houses* are often strongly impregnated. Many of these *rock-houses*, when they are low down and damp, are beautified by a luxuriant and ever green growth of rare and creeping ferns. Sometimes when the bluffs have thus been undermined by nature, their outer edges, in the course of time, gradually sink, and, in so doing, tear aloose or gap open along the perpendicular planes of division which are frequently present and more or less parallel to the faces of the bluffs, into long and deep, wedge shape trenches. These trenches, after they have become partly filled and their naked sides covered by debris, resemble very much old ditches or the ancient works of man, hence many conjectures have been advanced by the natives as to their origin. The most commonly accepted supposition by them, because it is the one held by the *old miners from California* or *the mineral rod tramps*, is that they are the remains of ancient *diggins* of gold and silver mines, which were worked by the Spaniards or some prehistoric race of people. Firm in this belief, the *mineral hunters* have freely expended their labor and means in the sinking of deep pits along in these so called *old diggins*, with what results may readily be imagined. Sometimes, on steep slants, there are several of these trenches, one above the other as so many terraces; in these instances they are perfectly parallel to each other, as were the original perpendicular planes along which they occurred. When the two sets of perpendicular planes exist, we have the bluffs splitting off in the huge cubical blocks or boulders which are so frequently seen along the beds of some of the larger streams and their steep embankments.

Along the creeks where they cut through these sandstones and conglomerates, there are always more or less cascades, and frequently there are perpendicular *falls* from a few feet to thirty and forty feet in height.

Shales.—Of the rocks of the Coal Measures in this county, these are next in extent to the sandstones. They are lamella and amorphous in structure, arenaceous and argillaceous in nature, grayish and lightish in color, and occur in seams from a few inches to sixty feet in thickness. The thicker seams, however, nearly always contain divisions of a few feet in thickness of very hard sandstones, which are generally of the flaggy kind. Being much softer and more easily decomposed, they present no such striking topographical features as do the harder sandstones and conglomerates. Their outcrops occupy usually slants, especially under cappings of the sandstones and conglomerates, and are commonly covered with debris from their own disintegration as well as from that of the harder rocks above. They form most of the productive and tillable soils of the Coal Measures. The sandy shales, which are usually of a dark gray color, are much the more abundant, and sometimes form beautiful rolling areas of considerable extent over the tops of the broad and high divides in the southeastern part of the county. These areas are a kind of *flatwoods*, which have a large growth, principally of black-jack and post-oak, and have no undergrowth, but have a luxuriant covering of grasses that go to make the best of natural pastures. Their sandy soil is shallow, and is of a gravelly nature from the presence of small angular fragments of the underlying hard shales. These sandy shales, especially, are often full of the impressions of fossil coal plants. The argillaceous or clayey shales occur in fewer and, as a general thing, thinner strata, and are softer and lighter in color than the sandy shales. They are usually tinged a little bluish, and often go by the *country name of blue slate.* They most frequently accompany the coal seams, and often contain, in greater or less quantities, nodules of *clay iron stone.* When thoroughly wet, they are plastic and resemble a good deal the light clays with which they are often associated. The parts of the roads over their outcrops are miry and sticky during wet seasons, and very hard and dusty, when perfectly dry. They are drouthy, and wells and springs of good lasting water are seldom met with in them. A *black bituminous shale*, from a few to sixteen inches in thickness, crops out in several parts of this county. It smells strongly of bituminous matter and burns freely with a smoky flame. It leaves, on burning, a large hard residue of a gray color. In places, it has a lamellar structure, while in other places it is amorphous, and has a kind of conchoidal fracture which resembles somewhat that of *cannel coal.* It is believed that this shale sometimes becomes a true stone coal. Wherever seen, there were some argillaceous shales near this black shale, that contained many balls of iron pyrites.

Clays.—The true clays of the Coal Measures in Marion county occur only along with the coal seams, or, as it is believed, at the proper positions for such seams. They are principally the underbeds to these seams, and vary from a few inches to several feet in thickness. They, before they are exposed, are usually quite pure and plastic, and are of a light color, which is tinged a slight grayish or bluish, but their outcrops are frequently gritty and of a yellowish color, from the admixture of foreign ingredients.

Stone Coal.—There is, we believe, in Marion county some twelve or more seams of coal which vary in thickness from a few inches to thirty inches. These coal seams are very persistent, and even the thinnest of them always, so far as we know, show at their proper positions more or less traces of their existence, while the thicker of them appear to be quite constant, both as to thickness and composition. These coals, as a general thing, are very hard and compact, and are free burning though they are not highly bituminous coals. They contain much mineral charcoal in thin sheets and are exceptionally free from all partings and impurities, with the exception of iron pyrites. They have been mined only to a small extent, and that after the crude process of throwing off the coverings from the weathered outcrops. These outcrops are most common, and are best exposed along the creeks and branches, and hence it is that all of the coal that has been raised in this county has been from along the streams. With the exception of a few boat loads that have been raised in the south-eastern part of the county, during low stages of the water and shipped off in times of freshets, there has been no coal mined in the county with the exception of that used by the neighborhood blacksmiths. After all the visible coal in one of these outcrops has been taken up from the bed of the stream, pits are sunk over the narrow bottom along the stream, through the usually few feet of mostly loose materials, down to the seam of coal, until the covering gets too thick, and then a new outcrop is sought. The immediate covering to the same seam of coal is sometimes very variable and has been seen to change, within a few hundred yards, from slate to hard shale and then respectively to shaly, slabby and massive sandstones. When this cover is the hard shales or sandstones, there is frequently seen to be running up through it, in all directions, for a few feet above the main seam of coal, vein like streaks of cubical coal, from the thickness of a knife blade to that of several inches.

The following general section is merely the result of a comparison and combination of a great many natural exposures which are scattered over the county, and while we cannot vouch for its accuracy, as some of the strata may have been left out entirely and others may have been repeated, still we believe it to be a rough approximation to a complete section of all the strata of the Coal Measures above drainage level in Marion county. The thicknesses of the different strata, with the exception of the coal seams, are nothing more than *guesses*, or were taken with the eye alone, as we had no instrument for such determinations.

A General Section of the Strata of the Coal Measures above Drainage Level, in Marion County:

Drift; pebbles, sands, clays. This deposit, over the uppermost of the rocks of the Coal Measures of this county, or over the ridges in the south-eastern part of the county, is thin.

(29) *Sandstones;* slabby and massive, friable, yellowish in color, coarse grain, and believed to be a *conglomerate* in places, 25 ft. 0 in.

(28) Coal; irregular and waving, with an underbed of hard bluish shale............ .... 6 in.

(27) *Sandstones;* massive, flaggy, slabby, forming bluffs in places. About ....85 ft. 0 in.

(26) Coal; hard. About......... .... 1 ft. 4 in.

(25) *Sandstones;* bluffy..... ....40 ft. 0 in.

(24) Coal; very hard, compact and uniform; it has no partings, but contains much mineral charcoal and also a good deal of iron pyrites. It has an underbed of clay, and its immediate cover changes from a hard bluish sandy shale to a flagstone. Black Creek Seam of Jefferson county..................... 2 ft. 6 in.

(23) *Sandstones, Shales, Clays;* with perhaps one or more thin seams of *Coal*.................................. 250 ft. 0 in.

(22) Coal; contains much mineral charcoal, and has an underbed of clay.......... .. .. 1 ft. 0 in.

(21) *Sandstones, Shales*............ . ...70 ft. 0 in.

(20) Coal; over clay......... .... 1 ft. 2 in.

(19) *Shale*; hard and bluish with plant impressions.... 4 ft. 0 in.

(18) Coal; reported to be .... 2 ft. 4 in.

(17) *Sandstones, Shales*...........................70 ft. 0 in.

(16) Coal; contains much charcoal. About........... 1 ft. 2 in.

(15) *Sandstones, Shales* .... .90 ft. 0 in.
(14) Coal; with an underbed of clay.................. 1 ft. 0 in.
(13) Conglomerates, *Sandstones, Shales.* The shales contain concretionary balls of iron ore. About....... ....100 ft. 0 in.
(12) Coal; about.................................. 1 ft. 2 in.
(11) *Shales, Sandstones*; the shales are mostly argillaceous, and form a clayey soil. Believed to contain one or more thin seams of *Coal*........................ ....80 ft. 0 in.
(10) Coal; reported to be about .... 1 ft. 2 in.
(9) *Sandstones, Shales*........ ....35 ft. 0 in.
(8) Coal ; undetermined, thin ....
(7) *Shales*; hard, bluish and yellowish in color; they contain plant impressions..................................15 ft. 0 in.
(6) Coal; thickening as gone into. It is believed to be thirty inches thick. Outcrop about................... .... 1 ft. 5 in.
(5) Conglomerates, *Sandstones.* Believed to be divided sometimes into two separate bluffs by shales with a seam of *Coal* near their top. *Upper Conglomerate of Tennessee*.. ..... 150 ft. 0 in.
(4) Coal; irregular, with clay underbed.................... 9 in.
(3) *Shales*; contains seams of sandstones............. 75 ft. 0 in.
(2) Coal; contains much iron pyrites and is very irregular in thickness.. 6 in.
(1) *Shales, Sandstones*; may be partly a *conglomerate*, and believed to contain one or more thin seams of *coal*.............175 ft. 0 in.

Drift.

The strata of the above section crop out as follows:

From (1) to (5) inclusive, along Bull Mountain creek.
From (5) to (9) inclusive, along Big Bear creek near Allen's Factory.
From (9) to (17) inclusive, along Kemp and Barren creeks and Buttahatchee River.
From (17) to (23) inclusive, on the creeks between Pearce's Mill and Gold Mime P. O.
From (23) to (29) inclusive, along Little and New Rivers.

Details.

The detailed character of the strata of the Coal Measures above drainage level in different parts of the county, are represented by the following sections:

I. Section on Bull Mountain Creek, in S. 2, T. 9, R. 14 W.

DRIFT: chert pebbles, sands, ferruginous sandstones, covering tops of divides .... 75 ft. 0 in.

(6) CONGLOMERATES, SANDSTONES; Very massive and bluffy, with large rock-houses, in which have been found the skeletons of men and dogs, with parts of guns, buried under heaps of loose rocks. These rock-houses, as well as the holes and crevices in the rocks, contain much copperas and alum. The lower part of these bluffs contain much *hydric ferric oxide* as a thin coating on the face of the bluff, and as thin veins running through the rocks, and as nodules or balls in the rocks. This conglomerate is believed to be the *Upper Conglomerate* of Tennessee .... 40 ft. 0 in.

(5) COAL; variable, covered in places by a few feet of hard bluish shale .... 9 in.

(4) *Clay*; white and plastic, seen down for .... 1 ft. 0 in.

(3) *Shales*; bluish in color, with seems of flagstones.... 75 ft. 0 in.

(2) COAL; variable; usually in thin seams through a foot or more of the hard bluish shale .... 6 in.

(1) *Shale*; forming bed of Bull Mountain creek.

The clay (4) of the above section, from the following analysis of it, seems to be a very good fire clay:

Specific Gravity	2.398	
Hygroscopic moisture, driven off at 100° C	1.344	per cent.
Combined water	4.728	" "
Silica	67.544	" "
Ferric Oxide	2.282	" "
Alumina	20.523	" "
Lime	00.000	
Sulphuric acid	trace.	
Undertermined and loss	3.579	" "
	100.000	

The following three sections of natural exposures of the same strata within the distance of three miles along Big Bear creek, will show how different these strata are or appear to be from their outcrops, within short intervals:

II. SECTIONS ALONG BIG BEAR CREEK.

(a) Section near the Lower Factory or Fall Factory, in N. W. ¼ of S. 13, T. 9, R. 12, W.

DRIFT; red sandy loam from which the bricks of the factory buildings were made. It contains many small well rounded flinty pebbles.................................15 ft. 0 in.

(4) *Debris;* surface covered with small angular fragments of sandy shales or shaly sandstones.........................60 ft. 0 in.

(3) *Sandstones;* massive ....40 ft. 0 in.

(2) *Sandstones;* flaggy and shaly................ 25 ft. 0 in.

(1) CONGLOMERATES; very hard and massive; in places it is full of well rounded small flint pebbles, while in other places the pebbles are scattering and few. They form high bluffs which at the Factory are 150 feet in height. From bed of the creek,80 ft. 0 in.

(b) Outcrop near the Upper Factory or Allen's Factory, in N. W. ¼ of S. 17, T. 9, R. 11 W.

DRIFT: a shallow deposit of sandy loam with a few rounded pebbles which are mostly flint though some are of chert.

(8) *Shales, Flagstones;* the shales are sandy, and contain seams of flagstones about ten feet apart.......................40 ft. 0 in.

(7) *Flagstones;* in places almost massive.......... 3 ft. 0 in.

(6) *Clay*; light and plastic, about.................. 1 ft. 0 in.

(5) COAL ... ½ inch
CLAY ....18 inches
COAL.... 2 "
CLAY.... 6 "
COAL.... 6 "
...............................2 ft. 8 in.

(4) *Clay* ; seen as deep as........................ 3 ft. 0 in.

(3) *Shales;* sandy, showing for.........................4 ft. 0 in.

(2) *Debris*; sandy soil with loose slab and flag rocks....12 ft. 0 in.

(1) CONGLOMERATES; not very massive, inclined to be slabby, with but few pebbles. From bed of creek.................25 ft. 0 in.

(c) Section near Factory Mill, or in S. E. ¼ of S. 17, T. 9, R. 11 W.

DRIFT; red sandy loam.............................15 ft. 0 in.

(9) *Sandstones. Shales;* the sandstones are slabby and flaggy and are separated by thin seams of shale................35 ft. 0 in.

(8) *Sandstones;* slabby, flaggy and massive............ 8 ft. 0 in.

(7) *Debris* ; believed to cover shale with a thin seam of *coal*.. 3 ft. 0 in.

(6) *Shale;* hard, yellowish in color.................. 8 ft. 0 in.

(5) *Shale*; hard, bluish in color .... 4 ft. 0 in.

(4) COAL; good, though it contains much iron pyrites. Thickening as gone into .... 1 ft. 0 in.

(3) *Debris;* doubtless covers shales and clays.......... 9 ft. 0 in.

(2) *Sandstones*; very massive and hard towards top and slabby near the bottom, of a light yellowish gray color ; forms the bed of the creek and the fall at the mill ....10 ft. 0 in.

(1) *Debris*; soil and loose rock which are believed to cover the *conglomerate.* To water............................ 8 ft. 0 in.

The *coals* (4) and (5) of sections (c) and (b) respectively, are the same; it does not show in the section (a), though, doubtless, it occurs in the upper part of (2) of (a). The conglomerate, or (1) of the sections (a), (b), and (c), is the same as (6) of *Section I*, and (5) of the *General Section*, and is the *Upper Conglomerate* of Tennessee. (3) and (8) of sections (a) and (b), and (8) and (9) jointly of section (c), are of the same strata.

Big Bear Creek has a swift current or a great fall with many perpendicular *jump offs*, of eight and ten feet, over the hard massive conglomerates and sandstones which form its bed and sides. It never goes dry nor freezes over and presents many splendid sites for the erection of machinery of almost any magnitude. At Fall Factory, Allen's Factory and the Factory Mill, the stream is about 150 feet wide and there is an easy obtainable head of water at these sites of over 30 feet, 16 feet, and 20 feet, respectively. It flows frequently deep down between two perpendicular walls of solid rocks, which are sometimes 150 feet in height, and in places cannot be ascended or descended for several miles. There is at Fall Factory, just below the dam, within a distance of thirty or forty feet, three *falls*, the upper one of about ten feet and the other two of about five feet each. Just below these falls, in the middle of the stream, there are several loose conglomerate boulders of from twenty to twenty-five feet through, that have fallen from the cliffs towering above some 150 feet. It is said to be impossible to get up or down these bluffs, except at one point, for two miles below the Factory. A foundation was gotten for this Factory by blasting down the side of the bluff and it is only a stepping distance from the top of the main building to the bluff. Along the creek near this Factory is presented a grand, wild and picturesque scene that beggars description and needs to be seen to be fully appreciated. There is also at the Factory Mill, only a few feet below the dam, a fall of some eight feet over very massive sandstones, of which no use is made. The projected Sheffield and Birmingham railroad crosses the creek just above this mill.

III. Section near Roden and Powell's Mill, (in S. 19, T. 10, R. 12 W.), on Kemp Creek.

DRIFT; rounded flint and chert pebbles, sands, ferruginous sandstones and conglomerates, near ....100 ft. 0 in.
(11) *Sandstones*; slabby, flaggy and massive.......... 60 ft. 0 in.
(10) *Clay.*
(9) COAL; it contains much mineral charcoal........ 1 ft. 2 in.
(8) *Shales, Sandstones*; the shales are hard and are of a grayish blue color and have seams of flagstones..............80 ft. 0 in.
(7) COAL.......... .... 1 ft. 0 in.
(6) *Clay.*
(5) CONGLOMERATE; very massive, it varies very much in thickness. Thinest .... 20 ft. 0 in.
(4) *Sandstones*; slabby and flaggy ....10 ft. 0 in.
(3) *Shales*; lamella in structure, contains a thin sheet of *Coal*... ....12 ft. 0 in.
(2) COAL; contains much mineral charcoal and iron pyrites .... 1 ft. 2 in.
(1) *Shale*; hard and of a bluish color ; full of plant impressions.

The conglomerate (5) is the same as (13) of the *General Section.* A weathered average specimen of *Coal* (2), from the exposed outcrop in Buttahatchee River, gave the following analysis:

Specific gravity	1.372	
Sulpur	.180	per cent.
Moisture, driven off at 117° C	1.793	" "
Volatile Matter	28.690	" "
Fixed Carbon	57.841	" "
Ash	10.676	" "
	100.000	

This coal does not seem to coke well and has an ash of a light grey color.

IV. Section near Haley P. O., in S. 7, T. 11, R. 11 W.

DRIFT; red sandy loam, and rounded large cherty and small flint pebbles.
(10) *Shale*; dark gray color........ ....40 ft. 0 in.
(9) COAL; thin, it is not more than a few inches thick.
(8) *Sandstones*; slabby, flaggy, massive; of a yellowish red color... ....30 ft. 0 in.

(7) *Debris*; sand, it is believed to cover sandstone near the bottom and shales above with a thin seam of *coal* near the top .... 25 ft. 0 in.
(6) *Shale*; hard, it is bluish at bottom and yellowish above. 10 ft. 0 in
(5) COAL; very variable and it is believed to be in places twelve and fourteen inches thick .... 2 in.
(4) *Shale*; hard and bluish in color .... 4 ft. 0 in.
(3) COAL .... 1 ft. 2 in.
(2) *Shale*; hard, bluish and full of fossiliferous impressions .... 2 ft. 0 in.
(1) *Sandstones*. slabby, in river, showing .... 3 ft. 0 in.

V. Section West of Pikeville.

DRIFT; round cherty pebbles with some few small ones of flint, ferruginous sandstones and conglomerates with the flinty pebbles, sands and sandy loams, about .... 150 ft. 0 in.
(22) *Shale*; hard and bluish in color, showing .... 12 ft. 0 in.
(21) COAL; about .... 1 ft. 0 in.
(20) *Slate, Clay*.
(19) *Sandstones*; slabby and of a yellowish color.
(18) *Debris* .... 40 ft. 0 in.
(17) *Sandstones*; massive and bluffy .... 25 ft. 0 in.
(16) *Shales* .... 10 ft. 0 in.
(15) COAL .... 1 ft. 0 in.
(14) *Clay*.
(13) *Debris* .... 40 ft. 0 in.
(12) *Sandstones*; slabby, flaggy, and massive; it forms bluffs .... 35 ft. 0 in.
(11) *Shale*; light, bluish in color and hard .... 3 ft. 0 in.
(10) *Slate*; black .... 4 in.
(9) COAL .... 6 in.
(8) *Clay*; light in color, showing .... 6 in
(7) *Debris* .... 50 ft. 0 in.
(6) CONGLOMERATES, *Sandstones*; the conglomerate is very massive and contains small flint pebbles; the sandstones contain false beddings .... 20 ft. 0 in.
(5) *Debris*; it doubtless covers shales and shaly rocks .. 15 ft. 0 in.
(4) *Shale*; argillaceous and of a bluish color, showing. 4 ft. 0 in.
(3) *Slate*; black, very variable .... 10 in.
(2) BLACK BITUMINOUS SHALE; variable .... 1 ft. 4 in.
(1) *Sandstone, Clay*.—The outcrop is a soft argillaceous sandstone which is a little sticky when wet and is of a very light color, hence it is known as *Chalk Bluff*. It shows in *Sanders' Bluff* to level of water in Buttahatchee River .... 10 ft.

The conglomerate (6) is believed to be the same as (13) of the *General Section* and (5) of *Section III*. The *black* *bituminous shale* (2) and the *slate* (3), just above it, seem to thin out to nothing or to be merely in places.

VI. Section near Mr. M. T. Akers', in S. 29, T. 12, R. 13, W.

Drift; loose ferruginous sandstones, which cover the surface........20 ft. 0 in.

(6) *Shales;* arenaceous and argillaceous, with grayish and yellowish streaks........20 ft. 0 in.

(5) *Shales;* argillaceous, very soft and sticky when wet. They are of a bluish color, and show about........10 ft. 0 in.

Shales; of a dull yellowish brown color on the outcrop. Clayey........8 in.

(4) BLACK BITUMINOUS SHALE. - In places it is lamella in structure; in other places, it is amorphous, and has a conchoidal fracture. It resembles *cannel coal*........4 in.

(3) *Shales;* argillaceous, soft and sticky when wet, of a bluish color and has running through it thin veins of *hydric ferric oxide* and contains a great many balls of iron pyrites........10 ft. 0 in.

(2) *Clays, Soil.*—The clays are mottled or variegated and on outcrop are arenaceous. The soils are sandy........10 ft. 0 in.

(1) *Debris, Soil;* from level of Beaver Creek at ford of Fayetteville and Pikeville road........20 ft. 0 in.

The above *bituminous shale* (4), smells strongly of bituminous matter and burns with a free smoky flame; it is believed to be much higher in the Coal Measures than the shale (2) *Section V*, and it is thought that they both very likely become true stone coals. An average specimen of this bituminous shale from the outcrop gave the following analysis:

Specific gravity	1.432	
Moisture, driven off at 117°C	10.267	per cent.
Volatile matter	38.193	"
Fixed carbon	27.106	"
Ash	24.434	"
	100.000	"

The ash is of a delicate pink color.

VII. Section on Little River, near Mr. O. P. Matthews', in S. 20, T. 12, R. 11, W.

(4) *Sandstones;* massive, flaggy and slabby; it is of a yellowish gray color. Forms great cliffs. The lower four feet is shaly........65 ft. 0 in.

(3) COAL; very hard and of bright and dull streaks; it contains much charcoal. *Black Creek seam of Jefferson county*.. 2 ft. 4 in.

(2) *Debris*; loose rock from (5), down to level of water in Little River...45 ft. 0 in.

(1) *Sandstones*; a hard fine grain sandstone, of a gray color, with black specks and streaks of carbonaceous matter and a thin seam of coal. Bored hole by Mr. Gould for "Lady Ensley Coal and Mining Company."............................130 ft. 0 in.

VIII. Section near McWhirter's Mill, on New River, in S. 22, T. 12, R. 11, W.

(11) *Sandstones*; massive, flaggy, shabby, bluffy; they are of an orange color....................................30 ft. 0 in.

(10) COAL; variable and waving.................................6 in.

(9) *Shales*; hard and of a bluish color...............35 ft. 0 in.

(8) *Sandstones*; very massive and bluffy..............20 ft. 0 in.

(7) *Shales, Sandstones*; shales at one place and sandstones in an other...4 ft. 0 in.

(6) COAL..1 ft. 0 in.

(5) *Shales*; hard and of a bluish color.............20 ft. 0 in.

(4) *Sandstones*; very massive in places, slabby in other places, variable in thickness, bluffy, and of a gray and orange color...40 ft. 0 in.

(3) *Sandstones, Shales*; sandstones in one place and shales in an other. Falsely bedded in many localities..........10 ft. 0 in.

(2) COAL; good and hard, though it contains much pyrites. In waves. *Black Creek seam*,.................................2 ft. 6 in.

(1) *Shales*; hard and of a bluish color, contains seams of flagstones. To water level in New River..............40 ft. 0 in.

Coal (2) above or (24) of the *General Section* crops out in a great many places on the head waters of New and Little Rivers, or is believed to be of the same seam as the following beds: Shirley, Hugley, Beauchamp, Burnett, Thompson, Musgrove, Garrett, Miles, Omary, A. M. McQuirter, J. W. McQuirter, Matthews, Vaughan, etc., the differences in level being due to the general and local dips, and perhaps in a few instances to faults. It covers about seventy-five square miles of the extreme southeast corner of the county and is of very uniform thickness and composition. Wherever seen, it was a very hard coal with much mineral charcoal and without any partings or was remarkably free from all impurities with the exception of iron pyrites. It has furnished nearly all of what little coal that has ever been mined in the county, and with an area of only fifty square miles in this county and an average thickness of thirty inches, it would contain 125,000,000 tons of coal. This coal gives on analysis, the following results:

	(1)	(2)	(3)	(4)
Specific gravity	1.252	1.271	1.102	1.551
Sulpuhr	.303	.460	1.730	.....
Moisture, at 117°C	2.611	4.245	3.694	1.755
Volatile matter	33.390	31.680	35.380	15.285
Fixed carbon	62.260	61.620	58.517	79.215
Ash	1.739	2.455	2.409	3.747
	100.000	100.000	100.000	100.000

No. (1). A hard coal, with horizontal planes of division along thin sheets of mineral charcoal, between streaks of brighter and duller coals. The bright streaks resemble *cannel coal.* The specimen analyzed was taken from a fresh dug pit and represented the whole thickness of the seam at a point where its top was several feet below the surface. It cokes well and has a red ash.
Locality: Thompson's bed, in S. E. ¼ of S. 5, T. 12, R. 11, W.

No. (2). A similar looking coal to *No.* (1). The specimen analyzed was an average sample of the whole thickness of the seam as it crops out under a high bluff, and and hence was more weathered than *No.* (1). It also cokes well and has an ash of a red color.
Locality; Woodruff Miles' bed, in N. W. ¼ of S. 22, T. 12, R. 11, W.

No 3. Firm coal, almost free from smut. It consisted of alternate layers of bright and dull coals, each about one-fourth of an inch in thickness, with a layer of mineral charcoal of about one-fourth inch thick.
Locality: Burnett's bed, in the N. W. ¼ of N. W. ¼ of S. 1, T. 12, R. 12, W., Marion county.

No. 4 Mineral charcoal, scraped from samples of coal from the Burnett's bed.
Locality: Burnett's bed, in the N. W. ¼ of N. W. ¼ of S. 1, T. 12, R. 12, W., Marion county.

The effects of the greater weathering of No. (2) is seen in the larger percentages of the *impurities* or of the hurtful ingredients, viz: Sulphur, water, and ash, and the correspondingly lower percentages of the valuable constituents or of the volatile matter and fixed carbon. Number (6) of the *General Section* or (4) of (c) under *Section II,* it is believed, would become, in a short distance from the outcrop, of workable thickness, or thirty inches or more in thickness.

Coal outcrops occur in the following and perhaps in many other sections, in this county:

Sec. 35	Township 8,	Range 14, W.
" 9, 17,	" 9,	" 11, "
" 13, 23, 32	" 9,	" 12, "
" 1, 2, 11, 12	" 9,	" 14, "
" 13, 15, 17, 18, 30, 33	" 10,	" 11, "
" 10, 15, 18, 19, 22, 23	" 10,	" 12, "
" 1.	" 10,	" 13, "
" 26	" 10,	" 14, "
" 5, 7, 29, 32, 36	" 11,	" 11, "
" 5, 7, 25	" 11,	" 12, "
" 4, 5, 6, 20, 22, 23, 26, 27, 28, 34	" 12,	" 11, "
" 1, 2, 8, 23, 25, 33	" 12,	" 12, "
" 2, 3, 10, 15	" 12,	" 14, "
" 3	" 13,	" 11, "

II. DRIFT.

This is a wide spread formation; it occurs in all parts of this county, and may be said to cover, at the least, three-fourths of the county. West of the Buttahatchee River, off of Bull Mountain Creek, it completely hides all other formations, and, elsewhere in the county, it is the superficial deposit over the high lands between the water courses, with the exception of a few comparatively small areas. In the western part of the county, where it alone is to be seen, we are unable to tell its thickness, though the streams have cut down into it, in places, to a depth of some two hundred feet, but, in the eastern half of the county, it is unevenly distributed from a few scattering pebbles over the naked Coal Measures to beds from 150 feet to 200 feet through. It thickens towards the south-west, and, as a general thing, though it forms great ridges 200 feet in height in the central and north-eastern portions of the county, it is comparatively thinly deposited over the eastern half, where it rarely exceeds fifty feet in depth and is not continuous, but occurs in patches or detached beds, some of which, however, are miles in length. It occupies topographically a high position, and, though it lies unconformably upon the denuded strata of the Coal Measures, it is believed to have been deposited before the present great channels or water courses were fixed, for the reasons that it is most conspicuous or thickest over the tops of the highest divides and contains rounded pebbles of materials of the underlying Coal Measures. It is stratified, though the strata are frequently obliquely laminated or are of irregular thickness. It shows everywhere the actions of abrasion, or of running water, and contains no sharp angular fragments or specimens, except of materials which were formed *in situ* or close by. It is composed almost entirely of siliceous matter, the most durable constituent of the rocks of which it is the *debris*, and, when first deposited, it was made up of alternate strata of only pebbles, sands and clays, though now it contains a great deal of ferruginous sandstones and conglomerates, and iron ores. These ferruginous sandstones and conglomerates, and the iron ores, were formed in place or near at hand, from the destruction of the original materials by atmospheric agencies.

Pebbles.—The pebbles are not only the most abundant of all these materials, but are even more numerous in the Drift of this county than in that of any other county in the State. They make up the great bulk of the formation, and occur in seams whose outcrops appear, most frequently, as nothing more than heaps of loose gravel. They, however, seem, from all external appearances, to have been dropped sometimes in huge piles, almost mountainous in size, without any evidence of stratification. They are principally of chert and flint, though some few of them are of hard sandstones and shales. They are all *water worn*, or smooth and rounded, and are principally elongated and flattened spheroids whose major axes vary from the fraction of an inch to six inches in length. In this county the greater portion of these pebbles are of cherty origin, which variety increases as the flinty pebbles diminish, proportionately, towards the south-west. These cherty pebbles are, as a general thing, larger and less rounded than the flinty pebbles, thus seeming to show, as they are also somewhat softer, that they have come a shorter distance, or that they have been exposed to less abrasion. They are seldom, however, larger than a hen egg, though occasional patches are met with in which many of them are as large as one's fist. They are usually of a dull or dirty yellow color, though frequently they are very hard and compact and of a real hornstone or flinty appearance. They are often fossiliferous and of oolitic structure, which shows that they have been derived from Subcarboniferous rocks, though, strange to say, no pebbles of the limestones of these rocks have ever been discovered in our *Drift.* The only fossils seen in this Drift were casts in the cherty pebbles, principally of crinoidal stems, and pieces of silicified wood. The flinty pebbles, though they are not near so abundant as those of the chert in this county, as a whole, still they are more numerous than these cherty pebbles in the extreme eastern and northeastern parts of the county. They, as a class, are smaller and smoother, or are more abraided than the cherty pebbles; the elongated axes of their spheroidal forms rarely exceed an inch in length. They are of all colors, and many are clear and translucent, and are perfectly beautiful. While in some localities, *jasper*, *agate*, *chalcedony*, *etc.*, varieties abound, in other places, they are nearly all clear and white, or milky. The colored ones appear to be, as a general thing, somewhat less smooth or worn, than those which are clear and milky. In many places, especially in the western part of the county, where these flint pebbles are unusually small and well rounded, they look as if they might have come from the disintegration of the *conglomerates* of the Coal Measures. Among the cherty and flinty pebbles, are some of hard sandstones and bluish shales, which are supposed to have been derived from rocks of the Coal Measures They are well rounded, and are principally of an egg shape, and are larger than those of chert and flint, though there were not near so many of them.

Sands.—This material, though it does not form near so prominent a part of the Drift as the pebbles, is found in all the different strata; it is mixed with the pebbles and the clays, and occurs in rather a pure state in separate strata and beds. It is usually of coarse grains, more or less rounded, and of an orange color. The outcrops of its strata are nearly always covered, either by other materials or by deep loose beds of sand from their own disintegration and the washings of the strata above. The deep beds of sand, however, irrespective of the outcrops, from the ease with which the material is held up or carried off by running water, are most common along the tops of the level or slightly rolling divides and the bottoms of the hollows. This material also forms a very large percentage of most of the loams of the *Drift*.

The Clays, though almost coextensive with the *Drift*, make up but a very small portion of it. They occur in regular strata along with those of the pebbles and sands, and are either of a lightish, reddish, yellowish, or variegated color. The colored varieties are nearly always gritty or highly siliceous, while those which are light, usually with a slightly bluish tinge, are often quite a pure plastic pipe clay, and would make, doubtless, very good common pottery. Many of the colored kind are well suited for the manufacture of ordinary bricks. As a general thing, it seems as if the colored or siliceous clays are high up or most common near the top of the *Drift*, while the lightest and purest are low down or near the bottom of the formation.

Ferruginous Sandstones and Conglomerates.—These rocks occupy a very high position, as they are found either capping or near the tops of the most prominent ridges and divides in the county. They, as already stated, were formed in place or close by and occur either in seams or in pockets, or as separate masses from the size of a pea to those which are tons in weight. They were formed by the hydric ferric oxide, which abounds in the *Drift*, percolating the sands and the pebbles, while in solution, and sticking them together on precipitating or on solidifying. They seem to increase with the Drift or as you go to the southwest. The ferruginous sandstones, though they are much the more universally distributed and, as a whole, are in much the greatest quantity, do not occur in as large bodies or in as large distinct masses, as the conglomerates. They occur principally in seams and are flaggy, though they sometimes, as well as forming rough and separate masses of all sizes, take many fantastic shapes and forms. The seams are sometimes quite uniform and extensive, and extend clear through the ridges and divides, as shown by the outcrops on both sides. They usually lie almost level, or along with the stratification of the *Drift*, but occasionally they appear to be standing upon their edges or are perpendicular to this stratification. The flagstones, from several inches in thickness down to even the thinest plates and scales, have often very smooth sides and are of very even thickness. The harder varieties of these sandstones make very good millstones, especially for small grain; the finer the texture the better the millstones made from them, though they occur in but few localities large enough and, at the same time, hard enough for this purpose. The conglomerates are all of the massive variety and, as a general thing, are of much greater thickness and in larger bodies, than the sandstones, though they do not occur in near so many places. They vary from a ferruginous sandstone, with only here and there an occasional small pebble, to a rough conglomeration of pebbles, stuck together by *hydric ferric oxide*, and from a loose friable and brittle rock to the toughest and most compact of *buhrstones*. Though they occur in seams and as separate boulders, they seem to be most abundant as vast accumulations in pockets or banks. The contained pebbles are all well *water-worn* or rounded, and, in some localities, are all or nearly all flint, while in other places, they are of a mixed variety or are of chert. The harder of these conglomerates serve well for the manufacture of millstones for grinding large grain or corn, and many of the millstones made from them are now in use in this and the adjoining counties of this State and Mississippi.

Iron Ore, as *limonite* or *brown ore*, is seen in the *Drift* of nearly all parts of this county but nowhere in sufficient quantities of pure enough ore to ever prove of any value. It, like the ferruginous sandstones and conglomerates, is found high up on the divides and ridges, and, like them, it is the result of natural agencies now at work. The iron of this ore, as well as that of the ferruginous sandstones and conglomerates, was derived from that disseminated through the original materials of the *Drift*, and was once held in solution and deposited or precipitated, just as it is now being done near *chalybeate springs*. It occurs in seams, pockets, and as separate masses, concretionary nodules, and excrescences to the ferruginous sandstones and conglomerates. It is very variable, and is frequently seen to change quite suddenly from a pure ore to ferruginous sandstones and conglomerates. That in the seams is usually inclined to be slabby and shaly or in thin scales, though occasionally it is massive, when, in places, it appears to be knotty or to contain very hard concretionary looking round spots, formed of concentric thin layers or shells of very good ore. It is generally very silicious, compact, hard, micaceous, and of a light red color, though, now and then, it is of a dark red color. The ore of these seams, as it frequently changes suddenly to sandstones and conglomerates, must have a like origin to them. The seams sometimes reach a thickness of two feet, and occasionally there are several of them, one above the other, lying conformably to the strata of the *Drift*, and, like similar seams of the sandstones and conglomerates, they extend apparently, clear through the ridges and divides, as their outcrops often show on both sides of these ridges and divides. The accumulations in banks and pockets, contain most of the purest and best of the iron ore of the Drift. The ore in these banks occurs usually in separate lumps or masses from the smallest size to boulders several feet in diameter, in a matrix of deep red sandy loam. The ore is frequently cellular and the matrix is occasionally of sand and pebbles. In the banks with the ore, there are sometimes spots of pure ferruginous sandstones. This ore, as separate and distinct lumps, is met with in all parts of the *Drift*, but most especially, over the tops of the highest divides and ridges. Occasionally, there are seen specimens of a very good quality of ore, but, as a general thing, it is, strictly speaking, a surface ore with a very high percentage of siliceous matter. It is usually in slabby and flaggy pieces, and is hard, compact and micaceous. These pieces are doubtless frequently fragments from the outcrops of seams. Often this surface ore, with a great preponderance of ferruginous sandstones or conglomerates, forms a capping and protection to the highest points of the ridges and divides. These loose distinct lumps are sometimes met with of very irregular and peculiar shapes, and as hollow concretions which are usually more or less round. These *concretionary balls*, in some instances, are more than a foot in diameter and consist of an outer shell,. scarcely ever thicker than an inch, formed of concentric thin layers of hydric ferric oxide, or ore, with a cavity which is usually filled with either red or yellow ochre, or with light micaceous sands. On cracking open these hollow concretions, the concentric layers, which form the shell, most commonly easily split apart and the enclosed ochres or friable sands easily spill out. This ore also occurs as nodules or lumps sticking to massive ferruginous sandstones and conglomerates, and as a thin coating to these massive rocks. These nodules or lumps are frequently the purest of needle and fibrous ores.

Silicified Wood.—There is often seen in the *Drift* of this county, especially along with the concretionary masses, chunks of silicified wood which form *buhrstone* looking rocks. These *silicifications* are nearly always covered with beautiful quartz crystals of many colors, which sparkle in the sun light like so many diamonds, and hence they are commonly known throughout the country as *diamond rocks*, and are said by some of the native to be the *bloom of gold, silver, etc.*

DETAILS.

On account of their general soft character and consequently the almost universal covering of loose materials and absence of bluffs, good natural exposures of the different strata of the *Drift* are very scarce. The following sections will, however, represent partially, at least, the character of the Drift strata in different parts of the county:

I. Section of Blaylock's Mountain, in S. 25, T. 11, R. 12, W.

(6) *Pebbles, Sands, Sandstones, Conglomerates.*—The pebbles are by far the most abundant of these materials and many of them are colored. The sandstones and conglomerates occur in scattering small fragments.................25 ft. 0 in.

(5) CONGLOMERATES, SANDSTONES; in small loose pieces, forming a belt around the mountain; they very likely cover the outcrop of a seam of similar rocks .... 5 ft. 0 in.

(4) *Pebbles, Sands, Conglomerates.*—Mostly rounded pebbles; the sand is in small quantities and the conglomerates occur only as a few loose pieces ....15 ft. 0 in.

(3) CONGLOMERATES, SANDSTONES.—Principally massive conglomerates with the included rounded pebbles mostly of chert, though some few are of flint. Forms a bluff around the mountain.................................... 6 ft. 0 in.

(2) CONGLOMERATES, SANDSTONES.—Loose fragments and boulders. They doubtless cover either a good deal of the lower part of (3) or another similar ledge. The sandstones are of a comparatively small quantity. These are the rocks from which most of the millstones have been gotten, and hence have given to the mountain its name of *Millstone Mountain*...25 ft. 0 in.

(1) *Pebbles, Sands, Sandstones, Conglomerates.*—Mostly rounded cherty pebbles, many of which are fossiliferous. In places, the surface is covered with loose pieces of ferruginous sandstones, which may be near the covered outcrop of an underlying seam of the same rock, about .... 100 ft. 0 in.

COAL MEASURES.—A fine siliceous soil of a light ashy color, with slabby and flaggy sandstones exposed along the creeks.

The above mountain is an isolated short ridge or hill, which the ferruginous sandstones and conglomerates near the top seem to have preserved from destruction, while all around, for several miles, has been reduced to a comparatively low and flat country. This *mountain* has furnished most of the millstones now in use in this county, and many for the adjoining counties. Some of these conglomerates are a mere mass of rounded pebbles stuck together, and hence are very coarse and rough. These coarse and rough *pudding-stones* are especially well developed in bluffs along Bull Mountain Creek, from near old Shotsville P. O. for some four miles down the creek.

II. Section near Old Shotsville P. O.,
S. 20, T. 9, R. 15, W.

(5) *Soil;* fine siliceous soil of a light ashen color, covering tops of ridges and divides.

(4) *Pudding-stones;* form a bluff, seen only at a distance, supposed to be similar to (2) below .... 20 ft. 0 in.

(3) *Pebbles, Pudding-stones;* debris, covering steep slant 30 ft. 0 in.

(2) *Pudding-stones;* rounded cherty pebbles held together by ferric oxide. Form bluffs with the ferric oxide in thin streaks and veins running in different directions. Between these streaks and veins of ferric oxide the pebbles are loosely held together, and in many cases have fallen out and left the faces of the bluffs *honey-combed* or full of holes. The pebbles are all chert, and vary from the smallest size to several inches in diameter.................................... 15 ft. 0 in.

(1) *Sands, Pebbles, Conglomerates, Sandstones.* All loose, over gradual slants, and believed to be covering strata of pebbles, sands, and loams. The orange sands and the rounded cherty pebbles predominate; the conglomerates and ferruginous sandstones are confined mostly to the upper part, just under the bluff (2)............................ 60 ft. 0 in.

COAL MEASURES.—Slabby, micaceous sandstones of a yellowish gray color; they form the bed of Bull Mountain creek, showing above water about .... 3 ft. 0 in.

The above bluffs of coarse and rough pudding-stones or conglomerates, resemble very much the *Bluff gravel formation* of the *Post Tertiary Group.*

III. Section near Mr. Beverly Collier's,
in S. 22, T. 12, R. 15, W.

(5) *Loam;* deep red and sandy, capping ridge ... 10 ft. 0 in.

(4) *Pebbles, Clays, Sandstones, Conglomerates, Iron Ores.* The pebbles are in excess, they are cherty and in loose beds. The clays are in seams, and have ashy colored outcrops. The iron ore, in considerable quantities, is shaly and slabby; and hard compact and micaceous; it is in loose fragments over the surface. The ferruginous sandstones and conglomerates are principally near the top.............. 90 ft. 0 in.

(3) *Pebbles, Soil.* The pebbles are cherty and the soil is siliceous.. 10 ft. 0 in.

(2) *Loam;* sandy, and of a red and variegated color, 25 ft. 0 in.

(1) *Pebbles;* in a loose bed, cherty; to bed of creek, 60 ft. 0 in.

At the foot of the divide of which the above is a section, on the east side, in the *second bottom* of Buttahatchee River, in S. 13, T. 12, R. 15, W., are the "*Henson Springs.*" These springs, several in number, are chalybeate springs and perhaps have other medicinal virtues. They are visited, during the summer months by many, in search of health, from this and the adjoining counties and from Columbus, Miss.

IV. Section near old Gold Mine P. O.,
or in S. 6, *T.* 12, *R.* 11, *W.*

(2) *Pebbles;* rounded, and of flint, chert, sandstones and bluish shales. Many of the cherty pebbles are fossiliferous, and all of the larger pebbles, so far as seen, are flattened ellipsoids with diameters from two to five inches and are of sandstones and blue shales of the Coal Measures. . 12 ft. 0 in.

(1) COAL MEASURES; blue shales, and sandstones of coarse grains and of a yellowish color. About..... .....30 ft. 0 in.

These pebbly beds have been worked to a considerable extent for gold. They contain this precious metal in finely disseminated particles or as *washed gold,* but not in sufficient quantities to pay to work, as the best hands, so it is said, could not pan out as much as fifty cents, in value, of gold per day.

In S. 7, T. 10, R. 12 W., near Chalk Bluff P. O., there is a deposit of white clay, which is known as *chalk bluff,* hence the name of the post office. It is near the junction of the Drift and Coal Measures, though it is believed to be of the former. It is exposed to a thickness of about ten feet, in a seemingly confused pile or highly inclined part of a slide, and consists of hard flaggy and irregular pieces which have a kind of conchoidal fracture. It is *chalky white* when dry, though the upper part of the outcrop is stained with a slight tinge of yellow and is a little gritty, from the admixture of foreign substances. It has a soapy or greasy feeling and resembles very much *kaolinite.* It is a fine refractory or porcelain clay, as shown by the following analysis of an average sample of the whole thickness of the outcrop.

Specific gravity	2.550	
Hygroscopic moisture, expelled at 100° C.	1.189	per cent.
Combined water	13.057	" "
Silica	47.197	" "
Alumina	37.756	" "
Ferric oxide	.906	" "
Lime	trace.	
Sulphuric acid	000.000	
	100.105	

The principal grades of iron ore of the *Drift* of Marion county are well represented by the following three analyses:

Specific gravity	3.325	3.217	3.369
Hygroscopic moisture, at 100° C.	1.571 %	2.365 %	1.716 %
Combined water	10.241 "	4.399 "	6.803 "
Silica	17.467 "	34.744 "	3.233 "
Ferric oxide	61.203 "	47.644 "	82.301 "
Alumina	5.530 "	9.001 "	.713 "
Oxide of Manganese	1.016 "	.340 "	.461 "
Lime	000.000	000.000	trace.
Phosphoric acid	.347 "	.133 "	.467 "
Sulphur	trace.	trace.	trace.
Undetermined and loss.	2.625 "	1.374 "	4.216 "
	100.000	100.000	100.000
Metallic Iron	42.842 %	33.351 %	57.674 %
Phosphorous	.152 "	.058 "	.204 "

No. (1) A very hard and compact ore, though some of it contains cavities which are filled with yellow ochre. The powder is of a dark brownish red color.
Locality: N. W. ¼ of S. 20, T. 9, R. 11 W.

No. (2) A very hard and compact *dye rock*, which is full of little shining particles of mica. It stains badly, like some *red or fossiliferous* ores. The powder is of a bright scarlet color.
Locality: S. 32, T. 9, R. 11 W.

No. (3) A good ore. Much of it is full of cavities and some of it is granular. Yellow ochre fills the cavities and interstices between the grains. The powder is of a yellowish brown color.
Locality: S's. 32 and 33, T. 12, R. 13 W.

The samples of which (1) and (2) are the analyses, were broken from ledges or the outcrops of seams, five or six in number, which appear to extend clear through the ridges. These seams were from eighteen to twenty inches thick and were separated by five and six feet of a seemingly mulatto clayey soil, which is full of thin shales or flakes of the ore and of ferruginous sandstone. Over the top seam there was about ten feet of a light clayey soil, then a covering, more than a hundred feet thick, of principally rounded cherty pebbles with many flint pebbles and much ferruginous conglomerates. Most of this ore was inclined to be shaly or slabby, though some of it was massive and contained *knotty looking* places which were formed of concentric rings of the ore. Much of this ore was micaceous and a great deal of it was nothing more than ferruginous sandstone; some of it was almost black in color, while some was of a deep red color. The ore (3) occurs scattered in separate boulders, from a few inches to several feet in diameter, through a matrix of deep red sandy loam over a thick stratum of rounded pebbles.

Near Mr. Chas. B. Britnell's, in S. T. 10, R. 12 W., the hollow iron concretions or balls or pots, with shells of thin concentric rings of ferric oxide, and the nodules or *warts* of pure fibrous and needle ores sticking to ferruginous sandstones, and, the chunks of silicified wood, covered with beautiful quarts crystals of many colors, are especially numerous, and with a great preponderance of ferruginous sandstones in loose fragments, seem to make up principally a consideradle ridge or hill.

2. WINSTON COUNTY.

This county has an area of 346,600 acres and a population, by the last census, of 4,263. It is therefore one of the most thinly settled counties in the State and has more that eighty-one acres *per capita* for every man, woman and child within its bounds. It would seem to the casual observer, merely passing through the county and keeping the highways, to have even a much greater preponderance of land to the inhabitants than this, for the reason that the public roads wind principally along the high ridges and divides, where the settlers as a general thing are but few, on account of the recognized thinness and sterility of the soil of these divides and ridges. The settlements are mostly along the edges of the coves and valleys where they are most convenient to water and to the farms.

More than nineteen-twentieths of this county still claims its virgin forests and by far the greater part of it is still *government lands.* The county has a mean annual temperature of about 58° F. and an annual rainfall of about 50 inches. The State Geologist has already, in his reports for 1877-78 and 1881-82, described, in a general and condensed way, the topography and geology of this county, and as these features are much the same as those that are described under Marion county, it will not be necessary to repeat here more of these descriptions than what is thought to be sufficient to connect and make plain additional data.

TOPOGRAPHY, ETC.

We can easily imagine that Winston county was once, from one end of it to the other, a part of a high table land or *flat-woods* country, which was covered with a luxuriant growth and was gently sloping towards the south-west and perhaps towards the south-east, and had not a single elevation or depression of any kind to relieve the sameness of the scenery. Its topographical features are now, not only varied but they are also grand, wild and picturesque and exhaust all of our descriptive powers. This great change has been brought about solely by the cutting away and wasting effects of natural agencies, and the variety is due to the different degrees of resistance that have been offered by the strata to these destructive causes.

These topographical features consist of high divides and table lands that are separated by abrupt channels which sink from two to three hundred feet below the general level of the country, and from which there run out and ramify in all directions numerous deep coves and gorges with precipitous sides. The high perpendicular and overhanging cliffs which follow up and mark out the streams and coves in all of their meanderings, and the deep and dismal looking gulfs which they enclose, present the striking and fearful pictures which nature has impressed upon the surface features of Winston county. These lofty cliffs are frequently from seventy-five to one hundred feet in perpendicular height, and, from the hardness and compactness of the materials which compose them, they mark out with a clearness and distinctness of outline the water courses and the coves whose crested edges they form. These hard and compact massive materials are usually covered to a shallow depth over the tops of the level and slightly rolling ridges with the sands and soils from their disintegration, but frequently they are naked and form bald and *glady places* of considerable extent. The bluffs frequently, in surrounding the ravines, butt right up against the tops of the high divides and give to the traveler as he passes along the highways, just above their cresent shape heads, a fine downward view of the magestic and sublime scenery presented by them and the frightful chasms below. It is often utterly impossible to get up and down these bluffs, except at a few points and at these points with great difficulty, and occasionally there are two or more of these bluffs one above the other which are usually separated by steep slants that are covered with debris. The wild and dark looking gulfs which are thus enclosed, are sometimes on account of their inaccessibility, called by such names as the *penitentiary*, etc. These cliffs split off in the huge blocks or boulders and contain the *rock-houses*, that have already been fully described under Marion county. These *rock-houses* are sometimes so numerous above the creeks as to give the name *Rock-house creek* to the stream that flows along just below their mouths. Some of them are enormous in size, it being no unusual thing to find them with such dimensions as the following: 250 feet long, 60 feet deep, and 50 feet high. Some of them are called *sounding bluffs* from the fact that a stamp of the foot at a certain point in them is heard to resound or echo through the massive rocks overhead and to gradually die away, making at first a louder noise than the original stamp. Some contain *deer licks* from their salty earthy deposits, mentioned under Marion county.

To reach the low level of the main water courses, the smaller streams frequently have to jump off the overhanging bluffs of hard, massive, weather resisting rocks in clear leaps of from thirty to forty feet and in so doing form falls of great beauty, which are well worth the travel of many miles to see. Some few of these falls are utilized to run grist and saw mills, but seldom is it that much more than one-half of the power or fall is brought into use. The most important and grandest of all of these great natural sights, from the amount of water and from their proximity to each other, are the *Clear Creek falls*, in S. 9, T. 12, R. 7 W., whose roar can be heard on a still day or night, for many miles. Clear Creek, above *the falls*, is some hundred feet or more higher than Sipsey River, and to overcome this great difference in level, it takes, within the short distance of two hundred and fifty yards, the two great leaps of thirty-seven and twenty-eight feet, respectively, in what are known as *Clear Creek falls*. The rest of the difference of altitude between the creek and river is included in the shoals and cascades which are above, below, and between *the falls*. For a full description of *Clear Creek falls*, see under *Section III, Details, Coal Measures.*

Just within the western limits of this county, and running entirely through the county, from north to south, there is a part of the great divide between the waters of the Warrior River on the east and those of the Tombigbee and Tennessee Rivers on the west. The waters which fall on the east side of the combs of some of the houses that stand on the crest of this great divide, in the north-western corner of the county, flow by the Sipsey, Warrior, Tombigbee and Mobile Rivers into the Gulf of Mexico at Mobile, and those which fall on the west side of the same houses go by the Big Bear Creek, the Tennessee, Ohio and Mississippi Rivers into the Gulf at New Orleans. This divide is known as the *Byler ridge,* from the road which follows it for its whole length of sixty or seventy miles. Its general direction is north and south. Within this county it can hardly be called a ridge, as its mean altitude is not much above that of the surrounding country between the main water courses. It is comparatively level on top, with but a few exceptions, and would make an excellent natural bed for a rail-road; hence, the projected Sheffield and Birmingham rail-road has been located along it, from where the survey enters the county, in the north-western corner, down into Walker county.

One of the strange and peculiar sights met with in traveling over this county, especially in the northern part, are the occasional low, flat and shallow ponds and sinks, which are seen on tops of the high and broad divides or table lands. *Gum Pond P. O.* took its name from one of these shallow basins, that is surrounded by a thick undergrowth of black-gum.

Soils.—The soils of Winston county are sandy, with the exception of some few clayey spots of comparatively small area. Those of the high lands, are, as a general thing, shallow and of a light color and sandy nature, and must be admitted to be very poor for the great staples, cotton and corn, of the South. These high ridges and table lands, however, with their health giving and invigorating atmosphere, and with the purest and best of water, if there was a convenient market, might be made to yield a good pecuniary return for cultivation in root and fruit crops and in grasses, and in the raising of stock. There are some high points, but with a small combined area, scattered over the county, especially in the southern and western parts, and principally along the *Byler ridge*, which are covered with a silicious soil, of fine texture and light color with a red sandy loam subsoil, that produces very well. The soils of the low lands, or of the second bottoms along the creeks and branches of the valleys and coves, are usually of a sandy loam, which is much deeper and darker and more fertile than those covering the high ridges and table lands. They not only generally yield good returns in cotton and corn and other crops, but are also easily worked and often form considerable bodies of land or farms which lie beautifully. The bluffs, in these instances, are back from the creeks, and the farms frequently extend and are cultivated right up to the brinks of the streams, which are deep down between perpendicular banks, and are sometimes not even seen until they are almost under foot. Though there are some clayey spots on both the high and low lands, the clayey soils are mostly on mean ground, or occupy the slopes and slants or hill sides, between the high and low lands. They are small in area, when placed side by side with the great body of sandy lands, and are always more or less gritty themselves. When mixed with a sufficient amount of sandy and organic matter, they become very good soils and yield remunerative crops. They are light and gray in color, and those of the high lands are also of red and variegated colors.

Springs.—Winston is a well watered and drained county. Several large streams extend through this county from north to south, and they, with their numerous tributaries, leave but little to be asked for, so far as water and drainage are concerned. The streams, especially those of the western half of the county, rise in and have along them springs that cannot be surpassed for their pure and delightful waters. These springs frequently occur in great clusters, and give rise to streams which are large enough and are occasionally made to run mills within a few hundred yards of their origin. Most of the lasting and good drinking waters, both of the springs and wells, in Winston county, come from coal seams, except that along the *Byler ridge*. *Chalybeate springs* are also in great numbers, and are scattered all over this county; they are most numerous in the *rock-houses* and along the rocky beds of the streams, and some of them, in the dryest of times, spout out streams of perfectly clear water half as large as one's wrist. They, when lasting, also rise principally in coal seams and spot the sides of the bluffs and the bottoms of the creeks with their orange deposits, from the color of which deposits the springs are sometimes called *yellow springs*.

Sulphur springs also occur in this county. The best known and perhaps about the strongest of these sulphur springs are the *Blue Springs* or *Keizer Springs* in S. 33, T. 11, R. 9 W. Dr. Keizer had spent considerable means in improving these springs for health resorts when the ruthless hand of war murdered him and reduced all of his houses to ashes. These springs are several in number and boil up from a low, flat, marshy place near Brown's Creek; their deposit is black, and, when the water is looked down upon in the *gum springs*, it appears blue, and hence the name, *blue springs*.

In S. 3, T. 12, R. 9 W., is the spring which is widely known in Winston county as the *Tar Spring*. From this spring there oozes up, with water, liquid bitumen or *mineral tar*, or a semi-liquid, black, sticky mass, which resembles very much the old pitch or tar from a wagon hub. The tar and water of this spring rises up through a small hole, one-half an inch in diameter, in the massive, friable, coarse grain sandstones, or bluff and glady making rocks, of the Coal Measures of Winston county, and, when first seen, the tarry matter was in the shape of a cone, several inches high, up through the center of which the hole in the rock was continuous, and from the apex of this cone the gentle stream of water was running. This tarry matter is said to be irregular in its flow, or to run out much faster at times than at others, and that, when it is running most freely, a lump of this tarry matter of the size of one's fist, can be gotten every ten or fifteen minutes.

Forests.—The forest of Winston county may be said to be almost untouched by the hand of man, as not more than one-twentieth of it has fallen before the woodman's axe. The large growth of this forest comprises the long and short leaf pine, the different kinds of oak and hickory, the chestnut, gum, beech, spruce, crab-apple, red cedar, etc., and its small growth or undergrowth, consists principally of short leaf pine and black gum. The long leaf pine is confined to strips and patches on the high points, in the southern part of the county, except in the extreme south-central part where the *piny woods* of Walker county extend their bold front up a short ways into this county. This very valuable tree is of very fine size, though it does not cover a very large area in this county. The spruce, crab-apple and red cedar are small in size and quantity. The spruce inhabits the low wet places along the creeks, while the crab-apple and red cedar are on the high and dry spots, and on the bluffs and glady places. The rest of the growth is of all parts of the county, and is often, especially in the bottoms, ravines, and hollows, composed of trees the largest of their kind. The forest, and hence the general aspects of this county, as in all of the adjoining counties, has suffered a great deal from the winds and cyclones of the last few years. The cyclones of April 1883 and 1884, were perhaps the most severe and destructive tornadoes that have ever visited this section of country, and in their north-east course through the county, they left their naked tracks, from one to one and a half miles wide, indelibly impressed upon the county, especially upon the high points, where seldom a tree is to be seen standing in their paths and where, for one-half a mile or more on each side of their distinctly and cleanly cut passages, are many fallen monarchs of the forest. The forests of Winston county were robbed by these two cyclones alone of what would perhaps have been worth to her, in a few years, more than a million of dollars of value.

GEOLOGICAL FORMATIONS.

The only Geological formations showing in Winston county are, (1) *Coal Measures*, (2) *Stratified Drift*. It will not be necessary to repeat here a great deal that has been said of these formations under Marion county, though it is equally applicable to them in this county.

I. COAL MEASURES.

These measures form the entire surface area of Winston county with the exception of a narrow, irregular, broken strip along the *Byler ridge*, and a few small scattering spots, off from this ridge, in the south-western half of the county. They are of the lower part of the *Coal Measures*, as shown by the fact that the head waters of Sipsey River in Lawrence county, some two miles north of the northern boundary of this county, extend down into the *Sub-carboniferous limestones*. Its strata have general dips, of a few degrees, to the south-west and to the south-east, and are added to or increased, and hence, as a whole, thicken in these two general directions. They have many local waves and wrinkles, with dips as high as 20° to the north-east and south-west, and numerous instances of *false bedding*.

These measures, as in Marion county, and as in all parts of our coal fields, consist of alternating strata of, (1) *Sandstones and Conglomerates*, (2) *Shales*, (3) *Clays*, (4) *Stone Coals*.

(1) *Sandstones and Conglomerates.*—These hard rocks are the most highly developed and make up much the larger part of the surface strata in Winston county. They are the bluff and glady making rocks. They crop out, in all parts of the county, in the high perpendicular and overhanging cliffs, along the streams and around the coves, and in the bare glady places, on the high and rolling lands. In some of the glady places, these rocks are perfectly naked over acres in extent. They are the rocks that cause all of the sudden *fall-offs* and marked features of the surface; and that form all of the roaring falls and most of the murmuring cascades of the streams, and that adorn and cover many of *nature's rock-houses*, and that give to the scenery of Winston county most of its variety and all of its wildness, picturesqueness and grandness. They are massive, flaggy, slabby and shaly; and are of orange, pinkish and brick-dust colors,

and are occasionally variegated with light and reddish streaks; and are most commonly inclined to be friable on weathering as they are composed of coarse grains. The conglomerates are of only the massive variety and oftentimes the same rock is within a short distance both a sandstone and a conglomerate, and frequently changes from one to the other. The massive variety also occasionally becomes a flaggy, shabby or shaly rock, and also *vice versa*. These softer rocks also change from one to an other. The massive rocks are also often intermediate between a sandstone and a conglomerate or are a real *mill-stone grit*, as they are composed of coarse crystallized quartz grains of about the size of a very large pin head, with perhaps an included stray or occasional well rounded flint pebble, not larger than a small English pea. These crystallyzed grains of sand in the weathered rocks, especially after the rocks have become mere heaps of clean sand, glisten and sparkle in the sunlight, with such intensity as to be unbearable to the eye. Some of these rocks are very massive indeed, or are from fifteen to twenty feet through, without a seam. These very massive and hard sandstones and conglomerates are usually the protecting and capping stones to the bluffs and softer materials below, and often have, in their weathered surfaces, empty holes with a coating or shell of hydric ferric oxide, from the half to an inch in thickness.

The flaggy, slabby, and shaly varieties, are all sandstones and usually show most plainly along the lower parts of the bluffs, under the massive capping stones, and along the beds of the streams. These are the rocks in which are best seen the *false bedding* and the local waves in the strata, and which are so often beautifully rippled marked. Frequently along the beds of the streams, the folds, of the local disturbances, in these flaggy and shabby rocks are decapitated, and sometimes the half folds of these decapitations, which are lowest down the streams, when they consist of alternating harder and softer strata, are washed out into *buckets*. In these instances, the softer strata are scoured out into holes or *pockets* while the harder strata are left sticking up or prominent, and thus the *pockets or buckets* are formed. Thse *buckets* partly catch the gravels and sands which are washed down the streams, and these loose materials frequently eventually become cemented together into hard ferruginous conglomerates and sandstones by hydric ferric oxide in its precipitations from the waters of chalybeate springs higher up the streams.

The flagstones are from the fraction of an inch to a foot in thickness, and in many places are of very uniform thickness, and have perfectly smooth and beautifully rippled marked sides and need only to be squared to be ready for the markets, or for their many uses. Many of these sandstones and conglomerates, instead of crumbling and falling to pieces, harden on exposure, which property makes them especially suitable for building purposes. The flaggy and slabby rocks, on weathering, often break up into angular and irregular fragments, from a few inches to a foot in diameter, and these fragments, becoming very hard and scattered over the surface, render the roads very rough and disagreeable to drive over.

Scattered over the tops of the high ridges and divides, especially in the shallow hollows, there are numerous deep beds of almost pure sand, from the disintegration of these rocks; and, in many places, on these ridges and sides, the surface is covered with small, dark, angular sandy gravels, from the weathering or breaking to pieces of the underlying shaly rocks.

Shales.—These rocks, as a general thing, occupy a comparatively low position, and though they occur all over the county, alternating with the sandstones and conglomerates, and are next in extent to these hard rocks, they seem to have become squeezed out or thinner as the massive rocks swelled out or thickened. They occur in seams from a few inches to some fifty feet in thickness, and vary in composition from the purest arenaceous to the purest argillaceous shales, with all the intermediate grades. They sometimes form low bluffs or banks, but their outcrops are principally along steep slants which, most usually, have cappings of the harder rocks. They frequently contain thin sheets of coal, and the thicker beds have generally divisions, at regular intervals, of seams of sandstones, usually flaggy, a few feet in thickness. They are most commonly, especially in the lower parts of the seams, hard, and of a lamellar structure, and, frequently, are full of the impressions of coal plants. The arenaceous shales are usually a yellowish or dark gray, to an almost black color; though they frequently become an orange color on weathering. They also on weathering often break up into angular gravels or fragments, which cover the surface over their outcrops. The argillaceous shales are commonly of a light ashy and bluish color, and form along their outcrops, when not mixed with too much siliceous and organic matter, a stiff clayey soil of a light grayish or mulatto color. These argillaceous shales frequently contain balls and nodules of *clay iron stone.* The bluish variety commonly accompanies coal seams and goes by the name of *slate or blue slate.*

Clays.—The clays are of a grayish white color, and of a fire clay texture. They occur in seams, some few of which reach a thickness of two and three feet. They are usually the underbeds to the coal seams, with which they are coextensive, and were seldom seen away from the outcrops of these seams, or from where we suppose there ought to have been a coal outcrop. They, in place, seem to be almost impervious to water, and when thoroughly wet, usually form a soft, sticky, plastic mud. Their outcrops are most commonly of an ashy gray color, from the admixture of dark matter, and along the roads, are frequently *hog-wallows* or mud holes, which, when dry, have a chalky appearance.

Stone Coal.—Stone coal is found in larger or smaller quantities in all parts of Winston county, though the measures of the north-eastern half of the county are almost *barren.* In the western and southern parts of the county, the coal seams reach a thickness of two feet, but nowhere in the north-eastern half of the county were they seen thicker than a few inches. Some sign or other of their presence were nearly always found at the proper positions for the different coal seams, though sometimes it consisted of nothing more than the merest traces of coal in the rocks, or of a thin sheet of clay or of only chalybeate springs, the almost invariable accompaniments of the coal outcrops in Winston county. Many of these seams, especially the thinner and lower ones, bear a very strong resemblance, in their outcrops, to those in the measures which cap the mountains of Madison, Jackson, Marshall and Morgan counties, though they are not near so thick. They have waves within waves and are very irregular. They occur in pockets or bulges, and frequently thin out, within a few feet, from their greatest thickness, of perhaps eighteen inches, to nothing. The bulges or thicker parts usually occupy the troughs of the smaller waves, though not always, for sometimes they form even the crests. These lower and thinner seams have sometimes an underbed of clay, but most frequently they are between and nearly always have a covering of hard rocks, which they often occupy for several feet, occasionlly as high as ten feet, with their innumerable thin streaks of coal. When the immediate covering, or the rocks thus occupied by them are a hard shale, the thin streaks of coal are usually horizontal or parallel to the main seam, but, when they are sandstones or conglomerates, the thin streaks of coal run through them in all directions, like so many arteries and veins. It is a peculiar, though no unusal sight to see these little veins of coal completely enclosed in and running perpendicularly through the overlying hard massive rocks. How they got there, or how they were formed, will perhaps be forever a mystery! When thus occurring between or in the hard massive rocks, these thin seams of coal are very hard indeed; in fact, they are almost as hard as the rocks themselves. Their general dips often correspond closely with the falls of the branches, and hence their outcrops are most often and most plainly seen along the beds of these branches and the bottoms of the adjacent bluffs, especially in the back parts of the *rock-houses* of these bluffs. The thicker and most of the higher seams, or those of the *upper measures* in the south-western half of the county, are much more regular in thickness and composition, and have not the peculiarities of thinning out so sudddenly and of running off in little streaks. Their underbeds are usually a clay and their immediate coverings, a hard shale which, frequently, is full of impressions of coal plants. They have local waves and wrinkles, which are of the larger kind and equally effect all the surrounding strata. Their coals consist of dull and bright streaks, without any clay or slate partings, and are firm and good; they are not so firm and hard as those of the lower thin seams but are purer and better, or are freer from pyrites, the only hurtful ingredient of these coals. The outcrops of the thicker seams in the south-western and southern parts of the county, have been dug into a little by the neighboring black-smiths; with these exceptions, no coal has ever been raised in Winston county.

Iron Ores.—Limonite, sometimes in considerable quantities, is often found mixed with and sticking to the fragments of ferruginous sandstone which lie loose over many of the ridges and divides; and clay iron stones and limonite, as nodules, occur in seams or layers, in nearly all of the heavy bedded argillaceous shales. Hydric ferric oxide is frequently seen, in thin sheets, running through and forming a coating to the pinkish and reddish sandstones; and copperas, usually associated with salt-peter and alum, in greater or less quantities, is of common occurrence in earthy deposits or as incrustations and excresences, especially in protected places, as under overhanging bluffs and in *rock-houses.*

The following general section, it is believed, will represent approximately the character of the strata of the Coal Measures above drainage level in Winston county. It does not aim at anything more than a *very rough approximation,* as it is merely the result of a combination of a great many natural exposures that are scattered all over the county, the thickness of whose strata were estimated with the eye alone.

General Section of the Strata of the Coal Measures above Drainage Level in Winston County.

(23)	*Sandstones, Shales;* forming the piney and flat woods country in southern part of the county	40 ft. 0 in.
(22)	COAL	6 in.
(21)	*Sandstones, Shales*	45 ft. 0 in.

(20)	Coal	9 in.
(19)	*Sandstones, Shales*	100 ft. 0 in.
(18)	Coal	1 ft. 4 in.
(17)	*Sandstones, Shales*	85 ft. 0 in.
(16)	Coal, about	1 ft. 0 in.
(15)	*Conglomerates, Sandstones, Shales;* may contain two or more thin seams of *coal*	280 ft. 0 in.
(14)	Coal	9 in.
(13)	*Shales, Sandstones*	4 ft. 0 in.
(12)	Coal, reported to be	2 ft. 0 in.
(11)	CONGLOMERATES, SANDSTONES, SHALES	75 ft. 0 in.
(10)	Coal; variable	6 in.
(9)	*Conglomerates, Sandstones, Shales*	96 ft. 0 in.
(8)	Coal	6 in.
(7)	*Conglomerates, Sandstones, Shales*	60 ft. 0 in
(7)	Coal; variable	10 in.
(5)	*Sandstones, Shales*	130 ft. 0 in.
(4)	Coal	2 ft. 7 in.
(3)	CONGLOMERATES, SANDSTONES, SHALES; may contain one or more thin seams of *coal*	220 ft. 0 in.
(2)	Coal	9 in.
(1)	CONGLOMERATES, SHALES, SANDSTONES; showing down to the waters of Sipsey River as it enters the county on the north, about	90 ft. 0 in.

These measures along Sipsey River, as it enters the county on the north, are believed to be not over fifty feet thick, or there is not believed to be more than feet of Coal Measues under (1) of the above section to the underlying sub-carboniferous rocks. They are however over 1200 feet thick along the southern boundary of the county, as shown by the above section.

The conglomerates of (1) and (3) of the above section are belived to be respectively the *Lower* and *Upper Conglomerates* of Tennessee and other States. They and the conglomerate of (11), of the above section, are the only conglomerates in the county, which appear to hold their own or which are not, in places, nothing more than a coarse grain sandstone.

DETAILS.

The following sections will serve to represent the detailed character of the strata of the Coal Measures in different parts of the county. They, like the *General Section*, are nothing more than coarse approximations to the truth, as they have been taken entirely from partially exposed outcrops and without any instrument for determining the thickness of the different strata.

I. SECTIONS IN NORTHERN PART OF THE COUNTY.

1. *Section on the Head-waters of Brushy Fork, in S. 25, T. 8, R. 8 W., near Gum Pond P. O.*

(8) *Soil*; fine silicious, of light ashen color........6 ft. 0 in.

(7) *Sandstones;* massive, light in color ....3 ft. 0 in.

(6) *Sandstones, Conglomerates;* massive; red in color, with pinkish outcrop. Just under these rocks is found water, at, very likely, the proper position for a seam of *coal*..10 ft. 0 in.

(5) *Shales;* sandy and hard, with seams of sandstone. The outcrop is of a yellowish gray color..................60 ft. 0 in.

(4) *Conglomerates, Sandstones;* forming bluffs with rock-houses containing springs. The lower rocks are very full of pebbles..40 ft. 0 in.

(3) COAL; variable, in thin seams in gray sandstone, running from nothing to 18 inches in thickness. Where seen, it was only...½ in.

(2) *Debris, Soil*; doubtless covering shale with perhaps seams of sandstone. It contains many concretionary masses and loose rocks. The concretions are often rounded and ball-shape and hollow, with a thin shell of ferruginous sandstone or limonite, and are full of light micaceous sands. Some of them are honey-combed and are very good specimens of ore. Some of the loose conglomerates contain very dark rounded flint pebbles and others have a coating, one-half an inch thick, of hydric ferric oxide, which renders them very hard..50 ft. 0 in.

(1) *Sandstones;* slabby and of fine grain, occuring along the bed of the creek. Many chalybeate springs rise in these rocks and in the winter months, or in wet weather, also a strong limestone spring, so it is said. The bed of this creek is not believed to be very high above the underlying sub-carboniferous limestones.

2. *Section on Head-waters of Sipsey River, at Hall's Mill, (Hubbard's old mill), in S. 32, T. 8, R. 9 W.*

(8) *Conglomerates;* weathering into beds of beautiful light and pinkish sands, with small, well rounded, flint pebbles. This sand really sparkles in the sun-light..............20 ft. 0 in.

(7) *Sandstones;* massive, shabby and shaly.........65 ft. 0 in.
(6) *Shale*; sandy, with an orange yellow outcrop; it contains seams of sandstone..............................40 ft 0 in.
(5) *Sandstones, Conglomerates;* massive and micaceous; yellowish in color. ....8 ft. 0 in.
(4) *Shales;* with seams of sandstones, believed to contain also a seam of *coal*................ ....35 ft. 0 in.
(3) *Conglomerates, Sandstones;* the conglomerates contain but few bebbles and the sandstones are massive, slabby and flaggy.... ....23 ft. 0 in.
(2) *Shale*; bluish and sandy ....2 ft. 0 in.
(1) *Conglomerate;* forming a high perpendicular cliff over which *the fall* occurs; lower ten feet very massive with yellow spots from chalybeate waters, the next ten feet a little slabby with small rock-houses in which are fine chalybeate springs, and the upper thirty feet to top of *fall* or bottom of dam, is massive........................... ....50 ft. 0 in.

All of the conglomerates of the above two sections may correspond to the *Upper Conglomerate* of Tennessee, here highly developed and separated by sandstones and shales, with perhaps some thin seams of coal, into four divisions. No. (1) of Section 2, is believed to be the same as No. (4) of Section 1. As the water leaps over (1) of the last section, with a clear fall of of some thirty feet, it forms a beautiful sight and a great water power. The low dam is built on (1), only a few feet above or from the edge of *the fall,* where the water begins to break. This stream rises in a cluster of beautiful springs; the farthest of which is said to be within one-half of a mile of the above mill.

3. *Section in S. 23, T. 9, R. 10 W., near Old Littleville P. O.*

(10) Drift; rounded flint pebbles with loose pieces of ferruginous sandstones near the bottom...............75 ft. 0 in.
(9) *Shales;* loose over steep slopes, likely contain seams of sandstones................. ....80 ft. 0 in.
(8) *Sandstones;* very massive, forming bluffs......15 ft. 0 in.
(7) *Debris;* covering steep slopes.................10 ft. 0 in.
(6) *Sandstones;* massive in upper part and flaggy and slabby below, forming bluffs....... ....15 ft. 0 in.
(5) *Debris*; covering doubtless shaly rocks, on a steep slant............................ ....10 ft. 0 in.
(4) *Shales;* hard and sandy, showing in *coal* pit....5 ft. 0 in.

(3) COAL; partly under water, said to have no parting and to be..2 ft. 7½ in.
(2) *Mother of coal;* so said..............................6 in.
(1) *Shale;* blue as reported.

Number (3) of the above section is a good firm coal; it was also cut through, in two places, on a branch in S. 13, T. 9, R. 10 W., where it measured thirty-one inches in thickness. The same seam of coal crops out on the head waters of Big Bear Creek, where, in S. 17, T. 9, R. 10 W., it was over twenty-four inches thick.

4. *Section along the Cheatham Road, between Sipsey River and Sandy Creek, in S. 3, T. 10, R. 8 W.*

(12) *Soil;* reddish......................................3 ft. 0 in.
(11) *Sandstones*.......................................10 ft. 0 in.
(10) *Shales*; bluish with a thin streak of *coal*..... 15 ft. 0 in.
(9) *Conglomerates, Sandstones*...................... 30 ft. 0 in.
(8) COAL; from nothing to twelve inches in thicknes....6 in.
(7) *Shales*; hard and bluish...................... 15 ft. 0 in.
(6) *Conglomerates*................................ 25 ft. 0 in.
(5) *Shales;* hard and bluish, with, it is believed, seams of sandstones, and a thin seam of *coal* near the top..60 ft. 0 in.
(4) *Conglomerate;* massive, forming bluffs with *rock-houses*..30 ft. 0 in.
(3) COAL; in thin streaks in hard shale.
(2) *Shales;* hard and bluish, full of plant impressions.5 ft. 0 in
(1) *Comglomerate ;* forming bluff along Sipsey River.... 40 ft.

(1) of Section 4 is believed to be the same as (1) of Section 2.

II. SECTIONS IN SOUTHERN PART OF THE COUNTY.

1. *Section at Lee's Mill (Partridge's old mill) on Sipsey River, in S. 18, T. 11, R. 7, W.*

(1) *Shale ;* sandy.................................... 30 ft 0 in.
(10) *Sandstones ;* very massive and perhaps a Conglomerate in places; yellowish in color. It is friable, and forms the high capping bluffs on south side of river........ 70 ft. 0 in.
(9) *Shales ;* outcrop of an orange color, believed to contain a seam of *coal*, near its bottom.................. 40 ft. 0 in.
(8) *Sandstones ;* massive, flaggy, and slabby, perhaps a conglomerate in places, form high bluffs with *rock-houses*, 75 ft. 0 in.

(7) Coal; very variable, changing from a streak to eighteen inches in thickness..................... .... 9 in.

(6) *Shales, Sandstones*.............................. 4 ft. 0 in.

(5) Coal; reported.............................. 2 ft. 0 in.

(4) *Shale, Clays*; sandy ....30 ft. 0 in.

(3) *Sandstones*; massive, flaggy, and slabby.......35 ft. 0 in.

(2) *Shale*; believed to have a seam of *Coal* near its top..... ....30 ft. 0 in.

(1) *Sandstones*; massive, flaggy, and slabby, forming bluffs and low falls along river. The flaggy rocks most beautifully rippled marked................. ....30 ft. 0 in.

2. *Section at Clear Creek Falls, in S. 4 and 9, T. 12, R. 7 W.*

(15) *Sandstones*; to about level of *Piney Woods*....45 ft. 0 in.

(14) *Shales*; slaty .... 3 ft. 0 in.

(13) Coal .... 1 ft. 0 in.

(12) *Shales*; bluish and sandy with divisions of sandstones................ ....30 ft. 0 in.

(11) *Sandstones*; massive, flaggy, and slabby . ...60 ft. 0 in.

(10) *Shales*; bluish and hard, may have a seam of *Coal* near its top.................................. .....30 ft. 0 in.

(9) Coal.. 6 in.

(8) *Sandstones, Conglomerates*; very massive; the sandstones are also flaggy and slabby, and the conglomerates have but few pebbles. The lower part of these rocks form the upper part of the *Upper Fall*..........................70 ft. 0 in.

(7) Coal; very variable, from eighteen inches in thickness to nothing .... 9 in.

(6) *Shales*; contain seams of sandstone, hard, form the lower part of *Upper Fall*........................20 ft. 0 in.

(5) *Sandstones, Conglomerates*; include bottom of *Upper Fall* and top of *Lower Fall*............. ....20 ft. 0 in.

(4) *Shales*; lower part of *Lower Fall*; bluish, with seams of *slab* and *flag stones*, and contain a good many balls of clay iron stone and a thin streak of *Coal*, near its top..20 ft. 0 in.

(3) *Sandstones*, massive, slabby, and flaggy, forming cascades below the *Lower Fall* ... .30 ft. 0 in.

(2) Coal; top of it slaty and contains much pyrites, in Sipsey River .... 8 in.

(1) *Shales*; hard and bluish, full of plant impressions, in Sipsey River.

(11) of 2, II, is the same as (10) of 1, II.

3. *Section near Nauvoo Mill on Black Water Creek, in S. 15, T. 12, R. 9, W.*

(11) *Sandstones, Shales* .... 20 ft. 0 in.
(10) COAL .... 6 in.
(9) *Shales;* hard and bluish .... 10 ft. 0 in.
(8) *Sandstones;* massive, slabby, and flaggy .... 15 ft. 0 in.
(7) *Shales;* blue .... 1 ft. 6 in.
(6) *Slate;* with a seam of clay near the middle .... 1 ft. 6 in.
(5) COAL .... 1 ft. 6 in.
(4) *Clay* .... 1 ft. 6 in.
(3) *Shale* .... 10 ft. 0 in.
(2) *Sandstone;* massive, flaggy, and slabby. .... 15 ft. 0 in.
(1) COAL; reported in Black Water Creek.

No. (1) of the above section is believed to be the same as *the thick seam* of Marion county, in which occur the Beauchamp, Thompson, McWhorter, etc., beds, or as the Black Creek seam of Jefferson county. In Mr. Larymoor's well in S. 14, T. 12, R. 9 W., it is said to be some three feet in thickness; and on *Black Creek* (of Winston county), in S. 33, T. 11, R. 8 W., it shows on the outcrop from fourteen to eighteen inches thick.

III. *Detailed Section of Clear Creek Falls, in S. 4 and 9, T. 12, R. 7 W.*

(10) *Sandstones, Conglomerates;* forming shoals and cascades for fifty or sixty yards above *Upper Fall* .... 6 ft. 0 in.

UPPER FALL.

(9) *Conglomerate;* very massive, does not contain many pebbles. Top to *Upper Fall* .... 12 ft. 0 in.
(8) *Sandstones;* flaggy and slabby, and has been washed out to form the *rock house* under *Upper Fall.* Contains a seam of *Coal,* as seen in thin streaks through several feet of rock, one-fourth of a mile below the *Lower Fall.* There is about four feet of hard shale just above this coal .... 26 ft. 0 in.
(7) *Sandstones;* flaggy and slabby, between *the falls,* 4 ft. 0 in.

LOWER FALL.

(6) *Sandstones;* massive, flaggy, and slabby; top of *Lower Fall* .... 8 ft. 0 in.
(5) *Shales, Sandstones;* the shales are bluish and have in them seams of slabby gray sandstones and a good deal of

clay iron stone, in nodules, occupying a seam; and, on its outcrop it has much copperas, as a white encrustation. These rocks form the back part of the *rock-house* under the *Lower Fall* .... 8 ft. 0 in.

(4) Coal; very hard; it may be in places nothing more than a slate............. .... 4 in.

(3) *Sandstones, Shales;* slab rock with thin seams of shale ... . 3 ft. 0 in.

(2) *Shales, Sandstones;* the shales are bluish in color and alternate throughout their combined thickness, with gray sandstones in seams, each, of 3 to 4 inches thick.. 8 ft. 0 in.

(1) *Sandstones;* forming shoals and cascades along the creek below the *Lower Fall*, to Sipsey River...... .....30 ft. 0 in.

The hard massive rocks of the upper parts of these falls, or (9) and (6) of the section above, project some six or eight feet as a covering to the *rock-houses*. below and behind the *over-poring* waters. In the rocks of the *Upper Fall*, about eight feet above or up the creek from the edge of the fall, and somewhat parallel to the edge, is a crevice, extending almost across the creek in a general north-east and south-west direction, along which the rocks of the fall will certainly, sooner or later, split off. The *Upper Fall* will thus and then, at one step and at one moment, recede eight feet up the creek. In this way, doubtless, by sudden leaps, *Clear Creek Falls* have worked most or all of their way back from Sipsey River, a distance of nearly one mile. Just below each one of these falls, in the bed of the creek, there have been washed out deep holes of unknown depth.

Clear Creek is a most beautiful stream; being fed mostly by pure freestone springs and having generally a rocky bottom, its water is as clear as a crystal. It is about fifty yards wide, and for several miles above *the falls*, it has, comparatively speaking, low banks and a smooth flat rocky bottom, over which the water glides swiftly, without a murmur, except as it reaches and runs over the little cascades. Below *the falls*, however, on to Sipsey River, it is accessible, with difficulty, in only one or two places, as its banks are high and perpendicular, and its bed is all rock and is very rough, consisting of rocky *jump-offs* and of huge loose boulders, over and against which the water rushes and foams with a great noise. For twenty-five or thirty steps above each of the falls, the water is very swift and would readily wash down man or beast, when above its lowest stages of from twelve to eighteen inches deep.

Clear Creek Falls, though they are of the greatest and best of water powers of this or any other State, on account of their being far away from any line of transportation, have ever been allowed to go to waste, but we hope and believe that this state of things will not last always, and that sooner or later they will be running the machinery of their full one hundred horse power. The *Upper Fall* was, years ago, made to run a *one-horse* grist mill, of which there are no traces left except the *race*. This race is wedge-shape and was cut in the hard rocks of the bed of the creek, along the eastern bank; it is some fifteen feet long, four feet wide, and ten feet deep at the face of the bluff or in the lower part where the wheel stood.

About three-fourths of a mile down the gulf or ravine below the *Lower Fall*, is another beautiful and grand sight, in the combination of a *natural bridge* and two water falls. This wild and picturesque sight is formed by the waters of a small branch undermining the hard capping rock of the bluffs, and leaping while yet under the *natural bridge*, thus formed, to a narrow ledge twenty-five feet below and thence rebounding into a clear fall of forty feet, down into the deep and dark gorge of Clear Creek.

Sticking to and loose along the bottoms of the bluffs of massive rocks, about one-fourth of a mile below the *Lower Fall*, with deposits of copperas and alum, are leached and porous semi-stalactitic looking masses, of a light color and of fine siliceous texture. These siliceous masses seem to have been once in solution, probably along with some of the coperas and alum in the deposits near them.

Outcrops of coal have been seen in the following, and they doubtless show in a great many other sections in this county:

Sec. 5	Township 8,	Range 8,	West.
“ 3, 8, 10, 13, 20, 23	“ 9,	“ 10,	“
“ 32, 34	“ 10,	“ 7,	“
“ 4, 8, 9, 16	“ 10,	“ 8,	“
“ 6, 7, 8, 17, 18, 21, 22, 23, 27, 28, 9	“ 10,	“ 9,	“
“ 2, 11, 12, 13, 21, 29	“ 10.	“ 10,	“
“ 31	“ 11,	“ 6,	“
“ 5, 7, 17, 18	“ 11,	“ 7,	“
“ 13, 16, 33	“ 11,	“ 8,	“
“ 10, 21, 22, 27	“ 11,	“ 10,	“
“ 2, 4, 8	“ 12,	“ 7,	“
“ 3, 14, 15	“ 12,	“ 9,	“
“ 15, 17, 18	“ 12,	“ 10,	“

Between two and three miles north of Houston, on the Moulton road, or in S. 16, T. 10, R. 7 W., there is scattered over a belt, around and near the top of a knoll on the high divide, much *black bituminous shale*, in loose pieces as large as three feet in diameter and eight and ten inches thick. Of course, the outcrop of the seam of which they are fragments, must be close at hand. These loose pieces have a slaty appearance, doubtless made more apparent from the weathering, and burn with a smoky bituminous flame and smell, to a bulky white residue but little diminished in size from the original shale. It is called and known throughout the county as *cannel coal*. Several fragments, broken from the larger pieces, gave on analysis the following results:

Proximate Analysis of Bituminous Shale.

Specific gravity	1.401
Moisture, expelled at 117°c	1.594%
Volatile matter	44.974 “
Fixed Carbon	20.977 “
Ash	32.455 “
	100.000

The powder was a little greenish and the ash was a very delicate pinkish gray. On and near the top of a ridge in S 12, T. 11, R. 9 W., there is a considerable accumulation of limonite which, in some few small spots, is quite good and pure. In S. 9, T. 12, R. 9 W., and in S. 21, T. 11, R. 10 W., there was seen a good deal of limonite and clay iron stone, in loose nodules and concretions which are scattered through a more or less clayey soil that was derived from the disintegration of shales. Over some of these localities, the *night lights* are said to flicker, and in some of them, the *mineral red men* have located their *mines of gold and silver.*

One of the above nodules of *clay iron stone*, with thin seams or streaks of pyrites, of a metallic lustre before weathering but which becomes, on weathering, surrounded by a white coating of copperas, gave the following analysis:

Analysis of Nodule of Clay Iron Stone,
from S. E. ¼ of S. W. ¼ of S. 33, T. 9, R. 10 W.

Specific gravity	3.465
Silica	7.252%
Carbonate of Iron	57.200 "
" " Magnesia	7.500 "
" " Lime	1.307 "
Manganese	trace.
Peroxide of Iron	8.338 "
Alumina	11.142 "
Phosphoric Acid	.416 "
Undetermined Water, etc	6.845 "
	100.000

Another specimen of this ore, from the same locality as the above or from near Miller's Stand P. O., gave on analysis the following result :

Analysis of Clay Iron Stone from S. 33, T. 9, R. 10 W.

Specific gravity	3.563
Hygroscopic Moisture	.967
Water in Combination	1.437
Siliceous Matter	3.209
Sesquioxide of Iron	7.918
Protoxide of Iron	42.082
Alumina	4.046
Oxide of Manganese	.186
Lime	2.418

Magnesia	3.486
Phorphoric Acid	.341
Sulphur	.317
Carbonic Anhydride	31.908
	100.315
Metallic Iron	35.000
Phosphorous	.149

In digging the foundation for the *Godfrey High School*, Mote P. O., in S. 20, T. 11, R. 8 W., there is said, by Prof. R. G. Isbel, to have been found, lying on a massive sandstone and covered by a shaly sandstone, a streak of *galena* which was about one-fourth of an inch thick, three-fourths of an inch wide and some fifteen feet long. This is the most reliable authority that we know of, of any *native metal* or *metalliferous vein*, other than those of Iron, ever having been discovered in our Coal Measures.

II. Drift.

This formation, especially in this county, occupies a very high position. It occurs in this county, only in the western half, unless the loose fragments of ferruginous sandstones and the deep sand beds over the tops of the high divides of the eastern half, which are believed to have come from the underlying rocks of the coal measures, are of Drift origin. Off of the *Byler ridge*, in the extreme western part of the county, or the great divide between the waters of the Warrior River on the east and those of the Tombigee and Tennessee Rivers on the west, it exists only as a few comparatively small patches, capping high points. It is not continuous, even along the Byler ridge, but is separated into patches by wide gaps, usually of the comparatively low places, in which the coal measures are the surface formation. These gaps were once doubtless covered by Drift, which has been washed away. It is, as a general thing, thinly deposited, though sometimes, along the *Byler ridge*, it reaches a thickness of seventy-five feet or more. It is made up of rounded pebbles, sands, clays, ferruginous sandstones and conglomerates. The original materials, pebbles, sands, and clays, seem, as a rule, in this county, to have been deposited in the order of their coarseness or abundance, or as mentioned above, but, sometimes, this order is reversed and the clays are found at the bottom or down next to the coal measures. The regular lines of separation between the strata of these different materials can not often be distinctly seen in the outcrops, for the reason that the materials have become more or less mixed by the freshets, etc., of time, but these materials however, nearly always abound in the order mentioned above.

The rounded pebbles are mostly of flint, though some few of them are of chert and a still less. proportion are of sandstones. The cherty pebbles are, as a general thing, larger than the flint, and the sandstone are even larger than the chert. The flint pebbles are usually elongated flattened ellipsoids while those of chert and sandstone are mostly *egg shape.* The flinty pebbles are of many colors and are often clear and translucent and perfectly beautiful. The cherty pebbles are often fossiliferous and those of sandstone have nearly always a dark exterior.

The sands occur in deep beds, sometimes of great purity, and as a mixture with the other materials, in greater or less quantities. They are usually of a light yellowish and orange color. The red and variegated varities are much the most abundant, and are generally nothing more than sandy loams with frequently the sand largely in excess. These colored loams occur only on the higher points along Byler ridge, principally as a subsoil to quite a productive soil. They usually make a very good common brick. The light clays, as a general thing, are much purer than the colored ones, and in some instances are almost free from even siliceous matter. These clays, when dry, often have a chalky appearance, and would doubtless suit very well for the manufacture of fire brick and ordinary pottery. They are the clays which occur out of the usual order mentioned above, or only at the very bottom of the *Drift* or immediately over the shales and sandstones of the coal measures.

The ferruginous sandstones and conglomerates, though they occur as loose fragments and boulders along with all the materials of the *Drift*, are most abundant in the pebbles. In some places these fragments and boulders are in considerable accumulations, with, frequently, a good deal of limonite, of very good quality, scattered among them. These rocks were not seen in any great quantities in this county and only as loose masses and fragments, though doubtless irregular seams do occur. The ferruginous sandstones are either slabby or flaggy, and the conglomerates, with flint pebbles, much less in quantity, are in rough irregular masses.

DETAILS.

The most eastern point at which the *Drift* was seen and known to be in place in this county, was in S. 19, T. 11, R. 8 W., about one-fourth of a mile west of Godfrey High School, Mote P. O. Rounded pebbles, however, which are believed to be of the *Drift*, occur over the second bottoms of the creeks as far east as *Clear Creek Falls*, though these are doubtless out of place or have been washed away from where they were originally deposited.

In S. 22, T. 9, R. 10, W., there is a thin capping, to a high ridge, of well rounded pebbles, they are mostly of flint of the usual shape and size, but there are a good many, including all the larger ones, of the egg-shape sandstones. These sandstone pebbles are of about the size of a hen's egg, and are composed of a dark shell, about one-fourth of an inch thick, with a soft friable core, of a light color, of friable sandstone or of loose coarse grains of sand. Near the eastern edge of this patch of pebbles, there is said to be a *chalk bed;* it is doubtless the outcropping of a seam of white clay, which lies just under these pebbles, and just over hard massive pinkish sandstones of the coal measures.

In S. 29, T. 11, R. 9, west, there is what is known as the "*Millstone Mountain.*" It is a ridge some three-fourths of a mile long and is much higher than the surrounding country. It has about the following approximate section:

1. *Section of Millstone Mountain in S.* 29, *T.* 11, *R.* 9, *W.*

DRIFT.

(4) *Soils, Pebbles, Sandstone;* forming the rounded top. The soil is of a light sandy nature and contains small, well rounded, flint pebble, showing in greatest quantities over the top of the ridge. It also contains fragments of ferruginous sandstones, especially along the sides..................60 ft. 0 in.

(3) *Millstone Rock;* forms a prominent ledge around the ridge. It is a very hard and compact, siliceous rock, resembling a good deal in looks the *knox chert* of North Alabama and the *burhstone* of South Alabama. In places it is nothing more than a hard, *very fine grain* sandstone. It might be softer on first being mined, but, after weathering, it is very hard indeed and often contains a coating, one-fourth of an inch thick, of hydric ferric oxide. It is principally of a light gray color and has no cleavage; being of a very tough, curled or knotted appearance; it seems to work with great difficulty and with about as much ease in one direction as in an other. In some few specimens of it, there were seen an occasional rounded flint pebble, of a dark color, though such were exceptions. Some loose pieces of this rock were scattered among the fragments of ferruginous sandstones above, of (4), and hence the ledge may be much thicker than it shows on the outcrop or there may be an other similar ledge higher up. Much of this rock has been made into millstones, and hence the name *Millstone Mountain* has been given to the mountain; it doubtless makes excellent millstones, especially for the grinding of small grain. The ledge on the outcrop is about....1 ft. 6 in.

COAL MEASURES.

(2) *Shales, Sandstones;* these shales, containing seams of sandstone, are of an orange color on the surface though they are doubtless bluish within; they contain fossil remains, six and eight inches in diameter, of coal plants with very distinct leaf impressions. About..........................100 ft. 0 in.

(1) *Sandstones;* massive, pinkish in color; the bluff and glady making rocks.

The following analysis is of an average sample of several pieces which were broken from the ledge or (3) of the above section, in different places :

Analysis of Millstone Rock.

Specific gravity	2.583	
Hydroscopic Moisture, expelled at 100°C	.195	%
Combined Water	.511	"
Silica	91.309	"
Ferric Oxide	3.802	"
Alumina	2.504	"
Lime	trace.	
Suphuric Acid	slight trace.	
Undetermined and Loss	1.679	%
	100.000	

The specimens analyzed were stained a reddish and a yellowish orange, and contained hard bony looking streaks and impressions, which were seemingly silicified twigs or branches and their moulds. The powder was of a brick dust color. Just under (3) there is *debris*, hence the *millstone rock* may not immediately overlie the coal measures, as represented in the above section. This ridge or mountain is covered with a most luxuriant growth of grass, though the trees on it are rather small and are principally of black-jack and post oak.

II. Section near the old "Miller's Stand P. O." on Byler Ridge, in S. 6, T. 10, R. 10 W.

DRIFT.

(9) *Soil, Sand;* a fine siliceous soil of a light ashy color with occasionally deep beds of orange sand. Growth principally black-jack and post-oak.

(8) *Loam*; subsoil, sandy; red in color..................15 ft.

(7) *Sand;* in deep beds of a light yellowish and orange color..................5 ft.

(6) *Pebbles;* well rounded and of flint of the usual size and shape, with an occasional one of chest. These pebbles have mixed with them a good deal of coarse sand and, especially in spots, much ferruginous sandstone and conglomerate, with a little limonite of good quality..................45 ft.

(5) *Shales;* of an orange color on weathering, may contain seams of sandstone..................55 ft.

COAL MEASURES.

(4) *Clays, Shales;* with balls of *clay iron stone.* The outcrop is of a light gray color. Believed to be the proper position for a seam of *coal*..... ....6 ft.

(3) *Sandstones;* massive and friable near the top, and shabby and shaly below. It forms bluffs with *rock houses* which contain fine springs......................................35 ft.

(2) *Debris;* doubtless covering shale and shaly rocks, and perhaps a seam of *coal* near its top.......................20 ft.

(I) *Sandstones;* bluffy and very similar to (3). The *rock-houses* in these bluffs contain many beautiful ferns, and the rocks just under their floors have streaks of *coal.*

3. CULLMAN COUNTY.

TOPOGRAPHY, ETC.

This county, though hardly in its teens and burdened with a natural poverty of soil, has made rapid progress in civilization and wealth. But a few years ago, it was of a wild desolate forest, with only here and there an occasional small clearing around a hut, whose occupants lived almost solely by means of the chase; but now it has churches and school houses without number and several towns, or a population of nearly 10,000, with some 30,000 acres in cultivation, and many a home with all the comforts that go to make it attractive.

The whole area of the county, computed at 277,600 acres, is of the broad elevated southern slope of *Sand Mountain*, or of the extension into this State of the south-western terminus of the Cumberland *table-land* of Tennessee. It has an average elevation, above the sea, of something over 800 feet. Its northern edge, being along the top of *Sand Mountain*, is some 600 feet higher than its southern boundary, but this ascent is made through the whole width of the county, and is so gradual as to be hardly perceptible. The northern slope of the mountain, however, principally just north of this county, is very sudden or steep, and is most often precipitous.

This county has a mean annual temperature of about 58° F. and a mean annual rain-fall of something like 55 inches, and is now attracting a great deal of attention on account of its mild and salubrious climate, and its pure and invigorating atmosphere; and is destined by nature to become a place of refuge from the summer's heat and dust and the turmoil of the busy marts.

These great attractions of climate and atmosphere, together with the cheapness of the lands, induced, first Col. J. G. Cullman, some thirteen years ago, to plant his now flourishing German colony at the site of the present capitol of the county, which, with the county, now justly bears his name, and then the great influx of settlers, which, at present, is almost without parallel, principally from the State of Georgia and the neighboring counties in this State.

It is a *flat-woods* country and would have possessed great sameness of physical or topographical features, had it not have been for the wasting effects of natural agencies. As it is, in a general way, it is a broad, flat, high plateau, gently sloping to the south-west, and considerably broken along the water courses whose common direction is also to the south-west. Along the comparatively level tops of the high divides, it is a beautiful country indeed, consisting as it does, of open woods with but little under-brush and a luxuriant growth of grass, and just enough rolling and indented with hollows and ravines to make the landscape pleasing to the eye.

The topographical features being due to the action of similar agencies upon similar materials, under similar circumstances, are very similar to those of Winston county, though they are not near so striking, and hence the descriptions given under that county need not be repeated here.

Soils.—The soils of this county, being derived from the sandstones and shales of the Coal Measures, are mostly shallow and of a light sandy loam, though there are a few scattering spots over the county, of a small combined area, of a stiff clayey soil from the disintegration of argillaceous shales. The soil of the divides or of much the greater part of the county, is usually of a fine siliceous texture and of a light ashy color, though there are considerable tracts, covering the outcrops of sandy shales and shaly sandstones, of a gravelly nature, from the presence of small angular fragments of the underlying rocks. These gravelly soils are held in high repute and occur in strips. The most important of these strips is in some places five or six miles broad and extend in a north of west and south of east direction entirely across the south-western corner of the county, and is known as the "*post oak belt.*" There are occasionally areas of considerable extent in the coves and hollows, and covering the second bottoms of the creeks, of a black sandy soil, the accumulated washings from the hill sides for years, which is much deeper and more productive than the light shallow soils of the high-lands.

This county is well drained and may be said to contain no swampy or first bottom lands. The soils are easily cultivated, and there are believed to be no class of people, any where, who live better, with as little work, and enjoy better health, than the farmers of *Sand Mountain.* The soils, either when fresh or exhausted, if left uncultivated, commonly grow up, at first, in sedge grass, which in a few years gives away usually to short leaf pine. These trees immediately, by means of their straw and roots, begin to fill up the waste places and to enrich *mother earth.* Though the soils of this county are naturally poor for our great staples, cotton and corn, still by frequent light dressings, judiciously applied, of a compost containing lime, they can be made to average two hundred and fifty pounds of lint cotton to the acre, of a much better staple than that of more favored regions. They can also be made to yield some twenty-five bushels of corn to the acre. These products, however, are not the crops for the "*Hill Country of Alabama,*" and, the sooner our people find it out, the better it will be for them and the State. This mountain soil, with a little strengthening, as well as the climate, is especially adapted to the raising of fruits, vegetables and grasses, and in proportion as these crops are cultivated, and cotton and corn let alone, will this beautiful and healthy region blossom and bear fruit. It is true that the peach and apple crops, for the last few years, have been very uncertain, but it is believed that these failures can, in a great measure, be remedied or that they are due more to neglect than to unavoidable causes.

Water. This county is not the best watered county in the State, and, to certain parts of it, this fact is a more serious draw-back than its sterility of soil. Though the larger creeks never go exactly dry and there are a great many wells and springs of lasting water scattered over the county, still in a great many sections of the county, during drouthy summers, good water, for both man and beast, becomes very scarce.

Forests. The principal forest growth of this county, is post oak, though there is considerable red oak, short leaf pine, hickory, chestnut oak, poplar, gum, beech, white oak, etc. The short leaf pine is, as a general thing, the largest growth of the up-lands, often reaching four and five feet in diameter, with the red oak ranking second in size. The poplar, beech, gum, and white oak, are mostly confined to the low-lands and are not unfrequently of very large size. These forests are usually open woods without any underbrush of consequence, but with most commonly, a luxuriant covering of grass, which, in the hollows and damp places, is frequently killed out by a rank growth of ferns. Over the high lands where the woods are very thin or the trees are far apart, there is nearly always much sedge grass.

GEOLOGICAL FORMATIONS.

The geological structure of this county is, in a general way, almost as simple as it can be, and may be said to consist of only one formation, viz: (1) *Coal Measures*, though the (2) *Mountain Limestone* is exposed in a narrow strip about one-half of a mile long in this county. The overlying *Drift* of Marion and Winston counties does not extend as far east as this county, and the underlying *sub-carboniferous* rocks are washed down to only by Flint Creek, in the above narrow strip, as it leaves the county:

I. COAL MEASURES.

These measures, in this county, present very nearly the same general features as was described under Winston county, hence it will not be necessary to repeat here all that was there said of them. They are of the lower rocks of the measures, as shown by the positions of the naked sub-carboniferous rocks, just beyond the county, on all sides with the exception of the western and south-western. The general dip of their strata is to the south-west, and, though only a few degrees, it is considerably more than that of the surface, and hence the measures thicken in this same general direction, varying in thickness from about 250 feet in the north-eastern part of the county to some 1300 feet in the south-western corner. They contain many waves and wrinkles and false beddings, but no faults of any consequence, so far as is known. These waves and wrinkles dip to the northeast and south-west, or their axes are at right angle to the great upheavals of the State. The waves are from a few feet to some six hundred or more feet in length, from crest to crest, and from the fraction of a foot to some twenty-five or thirty feet in depth, from levèl of top of crest to floor of trough.

These measures consist of a series of alternating strata of sandstones and shales, which are very changeable, and present hundreds of different phases. The lower two series of sandstones are substituted by conglomerates which, are truly conglomerates, especially near their bottoms, and are known in Tennessee and other States, as the *Upper* and *Lower Conglomerates.*

There are as many, and perhaps a few more, horizons of stone coal as there are of these series of sandstones or shales, but over much the greater part of the county, the coal seams are so thin that the measures will have to be considered *barren* for all practical purposes.

Sandstones, Conglomerates. These hard, massive, weather resisting rocks, form the *body*, as it were, to the county, and give to it its present form and structure. Had it not have been for these rocks, the county would have long since been occupying a much lower level and would have been much more varied, topographically, than it is now; they have held in check the destroying agencies and preserved, in some respects, the original state of things. They occur in some dozen or more variable beds, separated by shales and thin seams of clay and coal, and make up much the greater part of the surface area of the county. The sandstones occur also as comparatively thin seams or partings in the thickets beds of shale. The sandstones are massive, flaggy, slabby and shaly in structure, coarse and fine grain in texture, and light, grayish, yellowish, orange, pinkish and reddish or brick-dust in color. They show themselves almost solely along excavations of some kind or other and do not make naked or glady places, over the high lands, as similar rocks do in Marion and Winston counties. In fact, they do not seem to be altogether as highly developed as they are in Marion county or the western part of Winston county. The conglomerates are only of the massive kind and are confined, with perhaps one or two exceptions of a few feet each in thickness, to the two lower bluffy deposits of the series. They might be called the *guide rocks* to our coal measures and have, from their indestructible character, done more to preserve these measures, than all other rocks combined. Lying right at the base of the measures, they are the *foundation stones* upon which our superstructure of coal measures have been built. They are surface rocks in this county only along the northern and south-eastern boundary, where they present to the elements their bold and naked faces. Along the northern boundary, both the *upper* and *lower conglomerates* are cut through by erosion, and are exposed within this county; but along the south-eastern edge, only the *upper conglomerate* makes its appearance as a surface rock within the county, the other or *lower conglomerate*, occurring just beyond the county line, along the edge of the great anticlinal fold of Brown's Valley. They are made up of coarse quartzose grains with small, well rounded flint pebbles, seldom larger than a sparrow's egg and mostly smaller. These pebbles usually occur in a kind of irregular seam or streak, varying from a few to ten feet in thickness, near the bottom of each of the bluff deposits, and as an occasional pebble scattered, here and there, throughout the mass of the rocks. The sandstones are of all the varieties and colors, and take so important a part in the make up of the county that they might be called *the rocks of the county*. They form the greater part of the two conglomerate bluffs, where they appear to be somewhat harder and more massive than they are higher up in the series. Some of them, especially the colored or yellowish and reddish varieties, are of coarse grains and of such a soft and friable nature as to be easily cut with an axe, on mining or before weathering, while others, principally of the light and gray kind, are of fine grains, and even before weathering or when in the quarry, are almost as hard as flint. Many of these rocks harden on exposure, while others in a little time weather into a heap of slightly coherent grains of sand, eventually becoming nothing more than a loose sand bed, of perhaps many tons. The hard gray sandstones, especially, are often of uniform texture, and are a fine building stone, which is well suited for architectural purposes. The flagstones are frequently all that could be asked of them; they are fine grain and hard and of regular thickness, from one to twelve inches, with the flat sides either perfectly smooth or beautifully rippled-marked. These flagstones can be gotten in places, of almost any dimensions as to length and breadth, while in other localities they are cut up, by perpendicular parallel seams or planes of division, into ribbons or strips from three to four feet in width. These perpendicular parallel seams or planes of division, nearly always run north-east and south-west, though occasionally they run at right angle to this general direction, but were never seen to run in any other than these two directions. Sometimes these sandstones, in the same seam, at two localities within a stone throw of each other, are very different in thickness and texture, and sometimes the massive rocks seem to become flaggy, slabby, and shaly on weathering.

Shales.—The shales are second in abundance of the surface rocks of Cullman county. They occur in seams as high as seventy-five or eighty feet in thickness, and are usually of a dark gray color, of a hard and sandy nature, and of a massive and uniform structure, though occasionally there are thinner seams of them of a light gray or bluish color and of a soft and clayey nature. These shales, most often, crop out along slopes, and seldom, on account of their softness or destructibility, present good or clean natural exposures. As in the case of the sandstones, the same seam of shale sometimes varies very much in thickness. The thicker seams of hard sandy shales occasionally form bald, naked places, and are nearly always full of plant impressions; and the argillaceous shales, especially in their thicker seams, besides being fossiliferous, most frequently contain nodules of *clay-iron-stone*, in greater or less abundance.

Clays.—The pure clays of this county are in small quantity, and accompany the coal seams, principally as underbeds. They are soft and plastic, and are usually of a light gray color, though sometimes they are stained by foreign ingredients to a yellowish or mulatto color. They are thickest and best under the lower of the coal seams, where they sometimes reach a thickness of several feet, but, as usually seen, it is frequently a very difficult matter to distinguish them from the argillaceous or clayey shales which nearly always accompany them. These clays have been used some little to make jars and such like, and seem to answer very well for these purposes. In several parts of the county, there is to be seen covering the surface, in small spots, a stratum of red clayey loam, from the disintegration of shales which contain much iron, which makes a very good ordinary brick.

Stone Coal.—Coal is known to occur in nearly all parts of this county, but, with the exception of the uppermost seam, as believed, that covers a small area in the southwestern corner of the county, the seams are too thin, so far as they are known, to ever prove of any practical value. There are, at the least, some ten of these coal seams, or *coal horizons*, as some of them can hardly be called seams, but no one of them, except the top one, which is something over thirty inches thick, will average as much as a foot in thickness, the most of them being only a few inches thick.

Though so poorly developed in this county, some of these same coal seams in Tennessee will average, over large areas, three and four feet in thickness, and have furnished most of the coal that has been mined in that State. Even in this State, farther north and east than this county, these lower coal seams are frequently several feet in thickness, and occasionally swell out locally, over small areas, to seven and eight feet in thickness, but most often, though they are much more highly developed than in this county, they are not of workable thickness. Some of these coals, especially those of the seams just under each of the conglomerates, most frequently occur, in this county, as a number of irregular streaks, from nothing to several inches in thickness, occupying, in some instances, as high as fifteen feet of rock. These little streaks of coal are not only very variable as to thickness, but they also occur in waves, both as a whole and as individuals. When they are in the hard shales, they all, at any one point, usually have the same direction; but when they are in the overlying hard massive conglomerates, this is not the case, and though they, as a group, in these instances follow the general direction of the main seam, at the bottom, still they, as individuals, are not by any means parallel to each other, but each one seems to have a course of its own, as they run through the hard rocks in all directions. The upper coal seams of the county are of much more uniformity as to thickness and composition than the lower ones, and, as a general thing, are of much better coal.

The coals of the county, however, as a class, though they are sometimes bony and shaly, and are nearly always sulphurous, are hard, black, brilliant and free burning coals, but not very bituminous.

The following section is a general one and represents approximately the character of the strata above drainage level in Cullman county:

General Section of the Strata Exposed in Cullman County.

(19)	*Soil.*	
(18)	*Sandstone*	25 ft. 0 in.
(17)	Coal	2 ft. 6 in.
(16)	*Shales, Sandstones*	110 ft. 0 in.
(15)	Coal	6 in.
(14)	*Shales, Sandstones*; believed to possess several *coal-horizons*	175 ft.
(13)	Coal	2 in.
(12)	*Sandstones, Shales*; thought to have two or more thin seams of *coal*	200 ft.
(11)	*Shale*, Coal; coal in a few thin streaks	4 ft.
(10)	*Sandstones, Shales*; in alternate series, believed to contain, at the least, two *coal-horizons*	500 ft.

(9) Coal..6 in.
(8) *Shale*..35 ft.
(7) Conglomerate, *Upper Conglomerate* of Tennessee...35 ft.
(6) *Shales*, Coal; coal in thin sheets through the shale..15 ft.
(5) *Shale*..30 ft.
(4) Conglomerate, *Lower Conglomerate* of Tennessee...30 ft.
(3) *Shale*, Coal; coal in thin seams throughout the shale.12 ft.
(2) *Sandstones*, *Shales*; with a seam of *coal*, at least in places..25 ft.
(1) Mountain Limestone..40 ft.

Details.

The following three sections represent the detailed character of the outcrops respectively in the northern, central and southern parts of the county.

1. *Section near Holmes' Gap.*

(23) *Soil, Debris.*
(22) *Sandstone*; hard and of fine grains, of light gray color with black specks; weathering, in places, to a friable yellowish sandstone. *Holmes' Gap Quarry*............20 ft. 0 in.
(21) Coal; in thin sheets through the lower part of (22) and upper part of (20).
(20) *Shale*; very variable as to thickness, bluish in color, contains many nodules of pyrites and a white incrustation of *copperas* and *alum*, gives rise to some fine *chalybeate springs*. The upper part, in places, is falsely bedded. From 8 to 15 feet thick..12 ft. 0 in.
(19) *Sandstone*; yellowish and slabby............25 ft. 0 in.
(18) *Shale*; bluish in color, with *kidney balls*......8 ft. 0 in.
(17) *Sandstone*, *Debris*; the sandstone is massive and has some slab and flag rocks near its top. Debris, doubtless covers shale or the lower part of (18)............60 ft. 0 in.
(16) *Shale*, *Sandstone*, *Debris*; the sandstone is flaggy and slabby. Believed to contain a *coal* seam in its upper part..60 ft. 0 in.
(15) *Sandstone*; massive, coarse grain and friable on weathered surface; some flag rock and shale near the top....50 ft. 0 in.
(14) *Shale*, *Sandstone*; the sandstone slabby. May contain a seam of *coal* near its top....................60 ft. 0 in.
(13) *Sandstone*; massive, coarse grain, and friable on weathering..120 ft. 0 in.
(12) *Shale*; bluish, showing....................5 ft. 0 in.
(11) *Sandstone*, *Shale*, *Debris*; principally sandstone with divisions of blue shale. Believed to contain one or more *coal*-

horizons.... ....100 ft. 0 in.

(10) COAL; from 6 in. to 8 in. thick.....................7 in.

(9) *Debris*; loose rock ....85 ft. 0 in.

(8) CONGLOMERATE (UPPER); massive, and has pebbles distributed throughout it. Lower twelve feet contain eight or ten thin seams of *coal*, from the fraction of an inch to several inches in thickness. Variable, from 25 ft. to 50 ft...35 ft. in.

(7) COAL; in thin seams in the massive rocks above and the hard shales below. These thin seams sometimes run together and form a seam a foot or more in thickness. Said to occur in places 2 ft. 6 in. thich. A very hard coal; saw a pile of it, which had been exposed for twenty years and still the coal seemed to be as firm and as hard as when thrown out............... ....1 ft. 0 in.

(6) *Shale*; hard and massive with the thin seams of *coal* in upper part...... ....15 ft. 0 in.

(5) *Debris;* doubtless covering shales and flaggy and slabby sandstones, from 20 ft. to 40 ft...................30 ft. 0 in.

(4) CONGLOMERATE (LOWER); massive and bluffy; the pebbles are principally in lower part and are confined mostly to a seam or streak. *Coal* in thin and variable streaks occurs in the lower part; it runs from several inches in thickness out to nothing. Sandstone frequently forms upper part. Varies from 25 ft. to 60 ft...... ....30 ft. 0 in.

(3) COAL; in thin variable streaks through the lower part of (4) and the upper part of (2); it occupies occasionally as high as twenty feet of rock in thin streaks.

(2) *Shale, Clay* ; the shale is hard and massive and is of a dull dark color with the thin streaks of *coal*, principally near the bottom and top. It often contains a parting of clay. Of variable thickness, the line between it and the massive conglomerate above being very irregular.......... ...12 ft. 0 in.

(1) *Sandstones, Debris;* the sandstone is slabby and flaggy; the debris doubtless covers shale, and in places, a seam of *Coal* with an underbed of clay..................25 ft. 0 in.

Mountain Limestone; light gray limestone and debris.40 ft. 0 in.

2. *Section of a Drilled Hole near Cullman, by E. J. Smitz.*

(9) *Soil*...6 ft. 4 in.

(8) *Sandstone;* yellow...............................6 ft. 3 in.

(7) *Sandstone;* white and hard....................8 ft. 5 in.

(6) *Sandstone;* gray and hard...... ....12 ft. 3 in.

(5) COAL.................................. . ...2 in.

(4) *Shale;* argillaceous......... ....1 ft. 2 in.

(3) *Sandstone*, white and hard................ ...7 ft. 8 in.

(2) *Sandstone;* gray and hard .... 19 ft. 7 in.
(2) *Sandstone ;* white and hard, to bottom of hole....2 ft. 2 in.

3. *Section near Bremen.*

(8) *Soil ;* sandy.
(7) *Sandstone ;* masssive and coarse grain It is commonly of an orange color..... .... 52 ft. 0 in.
(6) COAL ; hard and good .... 2 ft. 6 in.
(3) *Shale ;* hard and sandy ....75 ft. 0 in.
(4) *Sandstone, Shale* ; the sandstone is massive, flaggy, slabby and is in very irregular seams ; it is of an orange color and is a coarse grain rock. The seams are separated by irregular divisions of bluish shales which are argillaceous, and contain concretions of *clay iron stone* ....30 ft. 0 in.
(3) COAL ; with clay just above and below it ....6 in.
(2) *Shale ;* clayey on top. It contains the *kidney shape iron ore balls*, and is sandy below and becomes yellowish on weathering. Very irregular in thickness. Said to contain a seam of *coal* 2 ft. thick, near the top ....150 ft. 0 in.
(1) *Sandstones ;* broad, flat, and flaggy. It occurs along the beds of the creeks, and is of a dark gray color.

The *General Section* comprises within (1) and (12), inclusive, Section I. ; and within (12) and (14), Section II. ; and within (14) and (23), Section III.

As is seen from the above sections, what is known in Tennessee and other states, as the *Lower Measures,* or the measures below the *Lower Conglomerate,* are very poorly developed in this county, or, in their outcrops, are not more than thirty-five feet in thickness, whereas in parts of Tennessee, just across the Alabama line, for instance at the *Etna Mines,* they are over 300 feet in thickness and contain some five seams of coal.

The upper *coal-horizon* of these *Lower Measures,* or the coal just under the *Lower Conglomerate,* or (3) of the *General Section* and of Section I., corresponds to or is the *Old or Main Etna* coal seam of Tennessee, the *Cliff Vein* of *Castle Rock,* Ga., and the coal seam of the Elkmont Coal and R. R. Co., of Jackson county, this State. At all of these mines it measures about three feet in thickness.

In S. 33, T. 8, R. 3 W., some six or eight feet of a dull black slate, intimately mixed with thin sheets of coal, takes the place of this seam of coal. It has been drifted into over fifty feet, in the hopes that it might all change to coal, but the result has been sad disappointment.

The other remaining *coal-horizon* of these *Lower Measures* in this county, or the lowest coal seam in the county, so far as is known, or (2) of the *General Section* and (1) of Section I. is believed to be identical with the *Dade Seam* of Ga., where it ranges from a few inches to seventeen feet in thickness.

The uppermost and most important coal seam in the county, (17) of the *General Section*, and (6) of Section III., does not extend far enough up into the county to cover more than twenty-five square miles. It occurs in the south-west corner of the county. It is high up and hence crops out in a good many places. Some of these outcrops in this county, are known as the *Bremen*, *Acock*, *Days*, *Calvert*, etc. coal beds. It is doubtless the same seam as the *Clifty*, *Leeth*, *Morgan*, *Gravelee*, etc. coal beds of Blount county, the *Black Water*, *Black Creek*, etc. coal beds of Winston county, the *Beauchamp*, *Burnett*, *Garrett*, *Thompson*, *Vaughn*, *Miles*, *McWhirter*, *Mathews*, etc. coal beds of Marion county, the *Phillips* and *Cordell*, *Magbee*, *Cole*, etc. coal beds of Walker county, and the *Black Creek*, etc. coal beds of Jefferson county. In this county it is easily recognized by its cover of a massive, hard, coarse grain sandstone of an orange color. In the outcrop which is known a the *Bremen coal bed*, in S. 22, T. 12, R. 4 W., where it has suffered much from weathering, there is exposed the following section :

4. *Section of Bremen Coal Bed.*

(10) *Soil, Loose Rock ;* massive orange sandstone, here weathered into a soft friable sandstone and sand, of an orange color .... 25 ft. 0 in.

(9) COAL ; black smut .... 3 in.

(8) *Shale ;* bluish and soft, argillaceous .... 4 in.

(7) COAL ; black smut .... 4 in.

(6) *Shale,* COAL ; bluish and argillaceous with thin streaks of coal .... 3 ft. 3 in.

(5) *Slate,* COAL ; slate black with thin streaks of coal .... 7 in.

(4) *Sandstone,* COAL ; the sandstone is very hard and is of a

dark gray color and contains thin streaks of *coal.* In places, this sandstone gives away to a dull black slate or *slaty mother of coal* .... 2 in.
(3) *Slate,* COAL; the slate is black and contains thin streaks of *coal* .... 9 in.
(2) COAL; hard and good .... 1 ft. 1 in.
(1) *Slate, Debris*; the slate is believed to be thin and to cover clay or shale.

At the *Acock bed,* in S. 14, T. 12, R. 4 W., the coal has been worked out by the neighborhood blacksmiths, back some twenty feet from the face of the bluff of massive hard rocks, forming the covering. This undermined cover stands firm without any supports. At this out-crop, the coal is hard, firm and good, but it is only fourteen inches thick. It has a soft underbed of either argillaceous shale or fire clay, and is covered, immediately, by the hard, massive sandstone which we have described.

As this seam of coal is especially well exposed in the *Clifty coal bed,* in S.7, T. 13, R. 4 W., though this coal bed is over on the Blount side of the county line, a section of it is given below. This coal bed is at the head of a ravine, under an overhanging, crescent shape bluff, and has about the following section:

5. *Section of Clifty Coal Bed, in S. 7, T. 13, R. 4 W.*

(9) *Sandstone;* massive, in places a little slabby, of an orange color .... 20 ft. 0 in.
(8) COAL; variable in thickness, occurring only in patches in the hard sandstone, very hard .... 3 in.
(7) *Sandstone;* variable in thickness, the same as (9) .... 10 in.
(6) COAL; variable in thickness, occurring in patches as (8) .... 3 in.
(5) *Sandstone;* similar to (7) .... 9 in.
(4) COAL; variable, breaks up into cubes, and is, in places, an impure *black-band* ore .... 3 in.
(3) *Shale,* COAL; hard shale with thin streaks of coal, very variable in thickness .... 3 in.
(2) COAL; very hard and good .... 2 ft. 5 in.
(1) *Shale, Debris;* the shale is hard.

There are outcrops of coal on a branch in S. 12, T. 9, R. 3 W. and along Eight Mile Creek, near the mouth of this branch, and also in S. 2, T. 8, R. 1 E. on Paritt Creek, one of the head-waters of Mulberry River, which though they vary from two to eleven inches in thickness, are believed to be of the same seam. Where seen, the immediate covering for about three feet, to these coal out-crops, was a very hard gray conglomerate, a real *millstone grit*, with very small pebbles, It is thought to be the lower seam under (10), *General Section*, and a seam in the upper part of (16), Section I. There are out-crops of coal in S. 29, T. 9, R. 1 W. and in S. 3, T. 10, R. 1 W. and in S. 1, 2, 14, T. 10, R. 2 W., which vary from an inch to ten inches in thickness and which are believed to be all of the same seam and to be included in (18), Section I., and to be the upper coal of (10), *General Section*. Where it crops out in S. 14, T. 10, R. 1 W., on *Copperas Branch*, it has the following section:

6. *Section on Copperas Branch, in S. 14, T. 10, R. 2 W.*

(5) *Soil, Loose Rock, Angular Sandy Gravels;* covering the surface	85 ft. 0 in.
(4) *Sandstone;* flaggy, forms a bluff	6 ft. 0 in.
(3) COAL; very hard	10 in.
(2) *Shale, Debris;* the shale is hard	12 ft. 0 in.
(1) *Sandstone;* shabby and flaggy, broad and flat, form the bed of the branch.	

The out cropping of coal given in the following section, occurs in S. 6, T. 9, R. 1 E., on Price's Creek, one of the head branches of Mulberry River, and is believed to be of the same seam as (9), (4), and (6) of the *General Sections*, respectively, of this county, Winston county and Marion county. In Winston county, its out-crops are over thirty inches thick and are known as the *Wilson coal bed* (near old Littleville P. O.), in S. 13 and 23, T. 9, R. 0 W., and as the *Eaton coal bed* in S. 17, T. 10, R. 9 W. In Marion county, it crops out on the head waters of Big Bear Creek and is, in the out-crop near Allen's Factory, over fourteen inches in thickness and has thickened as gone into.

7. *Section on Price's Creek, in S. 6, T. 9, R. 2 E.*

(7) *Soil;* about	70 ft. 0 in.
(6) *Sandstone;* flaggy and massive, showing	5 ft. 0 in.

(5) *Shale, Sandstone*; the shale is sandy and contains thin divisions of slabby sandstone; it is full of plant impressions........................4 ft. 0 in.
(4) Coal, Black Band Ore; the *coal* is variable and in places is an impure *black band ore*..........................6 in.
(3) *Shales*; hard..............................2 in.
(2) Coal; very impure, cubical........................4 in.
(1) *Clay*.

There has been some prospecting for coal in this county but no attempts at mining, except surface *diggings* for the use of the neighborhood black-smiths.

Coal out-crops show in the sections given below and perhaps in a great many others in this county:

Section	31, 32, 33, 34,	Township	8,	Range	3,	West.
“	30,	“	8,	“	4,	“
“	12, 29	“	9,	“	3,	“
“	2	“	9,	“	1,	East.
“	6	“	9,	“	2,	“
“	6, 7, 14	“	10,	“	3,	West.
“	2, 14	“	10,	“	2,	“
“	6	“	10,	“	4,	“
“	3	“	11,	“	2,	“
“	13, 20, 36	“	11,	“	4,	“
“	11, 12, 14, 15, 16, 22	“	12,	“	4,	“
“	12, 13, 11	“	12,	“	5,	“

Iron Ores. Capping some of the highest points in the county, as in S. 31, 32, T. 8, R. 3 W., there are considerable accumulations of *surface iron ore, limonite.* Though there are in these deposits a great many specimens of excellent ore, still the great bulk is nothing more than ferruginous sandstone, entirely too impure to ever prove of any value.

II. MOUNTAIN LIMESTONE.

The only place in the county not covered by the *Coal Measures*, is, as already stated, a narrow strip along Flint Creek, where the above sub-carboniferous rocks have been brought to the surface by denudation. These rocks extend up the creek from *Little Valley*, on the north, about one-half of a mile into this county, when they become covered by the overlying Coal Measures, having gradually thinned out from the time they entered the county, with a thickness of about forty feet above drainage level. They form principally steep slopes along the creek and are almost entirely hid by debris from the lofty cliffs just above them of the *Lower Coal Measures.* Where seen cropping out from under the loose rocks, etc., they were of a light gray limestone.

4 LAMAR COUNTY.

TOPOGRAPHY, ETC.

This county is but thinly settled. By the tenth census, it had a population of 12,142; of these the whites numbered 9,967 and the colored 2,175. It has an area which has been estimated at 377,600 acres; of which not more than one-fifth has ever been in cultivation. Its topographical, agricultural and geological features have been briefly described by the State Geologist in his reports for the years 1877-1878 and 1881-1882. They are similar, in a great measure, to those of the western part of Marion county, where the Stratified Drift is the only formation to be seen.

The surface irregularities of this county are all due to erosion, and hence the country is most broken along the water courses which have a general south west direction and empty into the Tombigbee River within the State of Mississippi. The divides between these main water courses are rolling plateaus or table-lands, from 200 feet to 300 feet above drainage level.

The growth, soil, etc., of this county are also similar to those of western Marion county, and hence need not be dwelt upon here.

GEOLOGICAL FORMATIONS.

The only geological formations that occur in this county are: I. *Coal Measures*, and, II. *Stratified Drift*.

I. COAL MEASURES.

These measures are to be found, as suface rocks in this county, only along the Buttahatchee River as it enters the county in the north-east corner. They extend, as a strip along the river, down into the county some seven or eight miles, before they become covered up by the *Drift*. They may just reach the county by way of Beaver Creek. They are higher up in the measures than the *coal rocks* of Marion county, with the exception of those in the south-east corner of that county, and are lower down than those of Fayette county. They consist of *sandstones*, *conglomerates*, *slates*, *shales*, *stone coals* and *clays*.

The sandstones are mainly massive, and are by far the most prominent of these rocks, as they form the bulk of the measures in this county. The only real conglomerate seen in these measures, in this county, is low down in them and is believed to be identical with (13) of the *General Section* under Marion county. The *coals* are comparatively thin, as will be seen from the accompanying sections. The strata have a general dip to the south-west and are in waves and are falsely bedded in places.

Some two or three miles within the county, these measures have about the following general section:

General Section of Coal Measures in Lamar County.

(14)	Drift; rounded cherty pebbles, ferruginous sandstones and conglomerates, sand and red sandy loam. Capping the divides	150 ft. 0 in.
(13)	*Shale*; hard and sandy, showing in a bluff	10 ft. 0 in.
(12)	Coal	10 in. to 1 ft. 0 in.
(11)	*Shale, Sandstone, Debris*; the sandstone is shaly	40 ft. 0 in.
(10)	*Quartzose Sandstone*; massive and coarse grain, forms high bluffs. Friable, in places, on weathering. Very much like a conglomerate, though no pebbles were seen in it	25 ft. 0 in.
(9)	*Shale*	10 ft. 0 in.
(8)	Coal	1 ft. 0 in.
(7)	*Debris*	40 ft. 0 in.
(6)	*Sandstones*; the lower part is slabby and flaggy, the upper ones are massive and form bluffs. Some	40 ft. 0 in.
(8)	*Shale*; hard and sandy	10 ft. 0 in.
(7)	Coal; outcrop showing about	6 in.
(6)	*Slate, Debris*. About	50 ft. 0 in.
(5)	Conglomerate; forming a bluff	20 ft. 0 in.
(4)	*Slate, Debris*; slate of a bluish color	8 ft. 0 in.

(3) *Black Slate*...................... ....10 in.
(2) BLACK BITUMINOUS SHALE; likely,in places a coal.1 ft. 4 in.
(1) *Clay, Sand;* they form a soft clayey or sticky siliceous rock, of a very light color, tinged slightly bluish. In places, this rock is a sandstone of slightly coherent grains. To water's edge in Buttahatchee River..... ... .10 ft. 0 in.

The above section crops out on the east side of the Buttahatchee River, along the Pikeville and Aberdeen road, with the exception of the conglomerate bluff (5), which makes up all of the Coal Measures, so far as has been seen, that shows west of the Buttahatchee River, in Lamar county. The *Drift* covers everything else west of the Buttahatchee River. This conglomerate bluff appears on the west side of the river, just below the lower ford of the Pikeville and Aberdeen road and near Mr. J. H. Real's house, in the S. W. ¼ of S. E. ¼ of S. 13, T. 12, R. 15 W., where it is a hundred or more yards in length. It is a quartzose massive sandstone, with small pebbles; it is of a light yellowish and orange color, and contains falsely bedded strata, and has a general dip of 5° or 6° to the south-west.

About 1½ miles above this conglomerate, on the east bank of the river, is Sanders' Bluff, or the *Chalk Bluff*, which is composed of the strata from (1) to (4) inclusive, of the above *General Section.* It is called the *Chalk Bluff* from the white or chalky appearance of (1). The black slate (3) of the *General Section* above, occurs only in places, and the *black bituminous shale* (2), is of very irregular thickness, it thins out within twenty-five to thirty yards from sixteen inches to a mere streak.

The most southern or south-western coal heard of in this county is said to be in the Buttahatchee River, in the S. W. corner of S. 19, T. 12, R. 14 W. It is believed to be the *black bituminous shale* (2), of the above *General Section.*

In the N. W. ¼ of N. W. ¼ of S. 15, T. 12, R. 14 W., on a branch, there is the following outcrop of the coal (7) of the *General Section:*

Section in N. W. ¼ of N. W. ¼ of S. 15, T. 12, R. 15, W.

(5)	*Soil*; of an orange color	10 ft. 0 in.
(4)	*Shale*; hard and of a bluish color. Showing	3 ft. 0 in.
(3)	*Slate*; black	4 in.
(2)	COAL; showing in outcrop	6 in.
(1)	*Clay*; showing about	1 ft. 6 in.

A little ways down the branch from this outcrop of coal, there occurs in the bed of the branch a slabby sandstone which dips to the south-west.

On an other branch, in the S. W. ¼ of N. W. ¼ of S. 10, T. 12, R. 14 W., near the site of an old *wild cat still house*, there is an outcropping of the coal (11) of the *General Section*. At this outcropping of coal, there appears the following section:

Section in the S. W. ¼ of N. W. ¼ of S. 10, T. 12, R. 14 W.

(6)	*Sandstone*; massive, coarse grain, very hard, as it is partly covered with a coating of iron oxide. It is of an orange color and forms high bluffs	20 ft. 0 in.
(5)	*Shale*; hard and sandy, of a bluish color. Showing about	1 ft. 6 in.
(4)	*Debris*	8 ft. 0 in.
(3)	COAL; about	1 ft. 0 in.
(2)	*Clay*.	
(1)	*Sandstone*; slabby and of an orange color, dipping to the south-west.	

This same coal, it is believed, has long been known in an out-cropping from under a high ridge, on a branch, in the S. E. corner of S. 3, T. 12, R. 14, W., where it has been much dug after by the neighborhood blacksmiths. It has been mined by throwing off, along pits and trenches, the few feet of its mostly loose covering over the narrow bottom along the branch. It is said to be about 1 foot thick, and its proper cover is a hard blue shale. Coal, which is likely of this same seam, is said to crop out in the S. W ¼ and S. E. ¼ of N. W. ¼, and in the N. E. ¼ and S. W. ¼ of S. W. ¼, of S. 10, T. 12, R. 14 W.

In the N. W. corner of S. 2, T. 12, R. 14 W., under the water in a small branch, in a deep ravine, some 150 feet or more below the top of the divide, there is an outcropping of the coal (15), *General Section.* It is 10 inches to 12 inches thick and appeared to have a thin streak of clay or soft clayey slate near the bottom, and had at the bottom, just over the underlying slabby sandstones, a thin seam of black slate. It is covered by a hard blue shale, that shows in a bluff for 10 feet to 12 feet in thickness. The coal at this outcrop has been dug after a good deal by the neighborhood blacksmiths, in the same way as that described above.

The coal outcrops of this county are confined, so far as is known, to Sections 2, 3, 10, 15, 19, Range 14 West, Township 12 South.

II. DRIFT.

This formation, with the exception of some ten or fifteen square miles or a narrow strip, seven or eight miles long, along the Buttahatchee River, in the north-east corner of the county, covers the whole county. It shows to a thickness of nearly 300 feet above drainage level and consists of rounded pebbles, sands and clays, and the rocks formed by the cementing together of the pebbles and sands by hydric ferric oxide.

The pebbles of this formation in this county are both flinty and cherty, and are much more numerous in the northern than in the southern part of the county. They are seldom seen, in quantity, on top of the main divides, but occur in beds, 12 feet and 15 feet thick, on the sides of these divides and covering the lower ridges. They are mostly cherty, or of the larger and more angular kind, and many of them are fossiliferous.

The sands and the clays occupy principally either very high or very low positions; they occur over the plateaus, on the tops of the high divides, and in the hollows and valleys, between these divides. The ferruginous sandstones and conglomerates are found on the tops, and near the tops, of all the ridges and divides, and form and have formed a most important part in making the surface features of the county what they are. The sandstones seem to be much more abundant, whereas the conglomerates are less abundant, than they are in the county of Marion. The iron ore that occurs along with these sandstones and conglomerates, is also in greater quantities, and much more of it is of a good quality, than in Marion county. All of these materials are similar to those of Marion county, and will answer to descriptions given under that county.

DETAILS.

Though the country in the northern part of the county, between Sipsey and Luxapolila rivers, is broken, it contains considerable good farming land, not only on the creeks and branches, but also on the divides, off from these streams. Its rise from Sipsey River is gradual and its water courses, comparatively speaking, are but slightly depressed below the general level of the country, until the streams which empty into the Luxapolila River are reached when the elevations and depressions of the surface become sudden and of great extent.

The growth of these high lands consists principally of post, black, red and spanish oaks, hickory, black-jacks, chestnuts, etc., with a scattering of short leaf pine, which, as a general thing, with the beech, oak, gum, poplar and cypress of the lowlands, are of the very finest quality. Near Mr. Beverly Collier's, in the N. W. corner of N. E. ¼ of S. 22, T. 12, R. 14 W., there occurs the following section:

Section near Mr. Beverly Collier's,
in the N. W. corner of N. E. ¼ of S. 22, T. 12, R. 15 W.

(5) *Red Loam ;* capping the divide ....10 ft.

(4) *Pebbles, Ferruginous Sandstone and Conglomerate, Iron Ore, Clay.* The pebbles are cherty and have mixed with them much scaly and compact, hard and micaceous, iron ore. They also have some ferruginous sandstone and a seam of clay of an ashy outcrop. Just under the capping red loam, there is considerable ferruginous conglomerate ....100 ft.

(3) *Pebbles, Soil ;* the pebbles are cherty ....10 ft.

(2) *Sandy Loam ;* of an orange color....................25 ft.

(1) *Pebbles ;* cherty, from bed of creek.................60 ft.

Near the foot of the ridge, of which the above is a section on the east side or on the edge of the *second bottom* of the Luxapolila River in the north-central portion of S. 13, T. 12, R. 14 W., there are the *Henson Springs*, that are also known as the *Crump Springs*. These springs are several in number and rise in a low flat place, at the foot of the above high ridge; they have the usual orange colored deposits of chalybeate springs, with the exception of one, which has a black deposit. They have a considerable reputation for their medicinal virtues and are visited annually by health seekers from this and the neighboring counties of Alabama and Mississippi.

At Mr. J. W. Kirk's mill on the head waters of Yellow Creek, in the N. E. ¼ of S. E. ¼ of S. 36, T. 13, R. 13 W., near the county line, there is exposed, in the banks of the creek, a plastic clay of a light bluish color, some twelve feet in thickness. The millstones in use in Mr. Kirk's mill are of the ferruginous conglomerates of the Drift, which crop out on the side of the mountain or high hill near the mill. The most of these conglomerates, however, which form a bluff with *rock-houses* near the top of the hill, are nothing more than coarse *pudding stones*.

On the side of the Military road, north of Moscow, the materials of the Drift are seen in regular stratification.

Mr. T. T. Hilburn, in the N. W. ¼ of S. 20, T. 14, R. 14 W., has one of the fine chalybeate springs which are so common in certain portions of our *Drift*.

North-east of Vernon, some three miles, there is a much talked of mountain or high ridge of iron ore. It, however, is nothing more than a ridge of ferruginous sandstone with a few scattering specimens of good ore. These ferruginous sandstones with some conglomerate and some little iron ore, are very abundant over the high divides south of Hell's Creek, in the N. W. corner of T. 16, R. 14 W. The country along this creek is very broken indeed, and the country people say that, as it is not fit for farming purposes, it must contain precious metals, which, as they say, are indicated by the *flickering of the night-lights*. Two lines of a projected rail-road have been made to run up this creek. Near Cobb's

Mill, on Yellow Creek, about ½ mile east of Vernon, there are said to be several old pits, now partly filled up, which are supposed by the natives to have been dug by the Indians or a former race of people, in mining gold, silver, or lead. Old trails, it is said, are to be seen, leading to and from these old mines or pits. These *old holes* are in a hill or ridge of sands and pebbles of the Drift, and perhaps a little of the siliceous iron ore.

Though good cabinet specimens of iron ore are to be picked up in all parts of the county, from among the ferruginous sandstones and conglomerates of the Drift, which cover the hill sides and tops of the ridges, still this good ore has been seen in only one locality, in the county, in sufficient quantity to ever prove of any value. This locality is WSW. of Vernon, the county seat, about two miles, where the ore abounds in two hills of about 25 to 30 acres each. The nearest of these hills to Vernon is in the S. W. ¼ of N. W. ¼ of S. 20, T. 15, R. 15 W., and is at the site of the old "*Hole and Murdock Iron Works;*" the other hill, which is a counterpart of the first, is in the S. W. ¼ of S. W. ¼ of the same section. The ore occurs, in these hills, in loose masses from the size of a pea to boulders several feet in diameter, and is collected together in pockets, throughout a matrix of deep red sandy loam. In and between these pockets of ore are similar deposits of ferruginous sandstones and conglomerates, showing, most plainly, that the iron of the two has been derived from the same source, and that the two have been formed in the same way. The ore is principally of a concretionary and cellular character, the particles being held together and the cavities being filled with mostly yellow and red ochres. The better part of the ore contains from 50 to 60 per cent. of metallic iron and has a large amount of phosphorous, which ranges from .2 to .3 of one per cent. The following analyses of three characteristic specimens of this ore are taken from the State Geologist's Report for the year 1877-1878.

Analysis of Iron Ores from the Banks in S. 20, T. 15, R. 15 W.

	(1)	(2)	(3)
Specific gravity	3.4213	3.461	3.392
Hydroscopic Moisture	1.777	1.468	3.843
Combined Water	12.466	12.372	8.155
Siliceous Matter	4.371	4.867	4.506
Sesquioxide of Iron	78.284	80.053	81.183
Alumina	.760	.221	1.341
Oxide of Manganese	.000	.188	0.073
Lime	.809	.407	0.298
Magnesia	.391	.045	0.032
Phosphoric Acid	.615	.624	.268
Sulphur	.120	085	.138
Undetermined and Loss	.398	.170	.173
	100.000	100.000	100.000
Metallic Iron	54.80	56.037	56.821
Phosphorous	0.268	.272	0.117

No. 1, was an aggregate of compact and dark brown nodules, which were held together by red and yellow ochres. There were a few empty cavities in and between these nodules. The streak was a yellowish brown.

No. 2, was a concretionary limonite of uniform texture. It had a dark brown color and had some of the cavities filled with red and yellow ochres. It had a reddish brown streak.

No. 3, was a compact dark brown limonite with a few irregular cavities. Some of the cavities were filled with red ochre. The streak was reddish brown.

This ore is said to have worked easily in the furnace and to have yielded an iron of most excellent quality.

The Hale and Murdock Iron Works consisted of a cold blast charcoal furnace and a foundry. This furnace was run for some ten years, shutting down in 1867 or 1868, so it is said, from bad management and the want of transporting facilities. The flux and the products had to be hauled, in wagons, from and to Columbus, Mississippi, a distance of some 35 miles.

There is also said to be considerable good iron ore on a hill in the S. E. $\frac{1}{4}$ of N. W. $\frac{1}{4}$ of the same section as the above banks. In the north-east corner of T. 16, R. 16 W., there are mountains of ferruginous sandstones with some few scattering specimens of good ore.

The south-eastern part of the county, especially along the waters of the Luxapolila River, is very broken. The hill tops and sides of that part of the county are covered with the ever present ferruginous sandstone.

5. FAYETTE COUNTY.

This county by the census of 1880 had a population of 10,135; white, 8,873 and colored 1,262. It is estimated to have an acreage of 384,000, of which more than five-sixths is still covered by its native growth. Its topographical, geological, and agricultural features have been briefly spoken of by the State Geologist in his reports of progress for the years 1887-1878 and 1881-1882.

TOPOGRAPHY, ETC.

This county is made up of four divides and the valleys of three rivers and their tributaries. The divides have a common north and south direction and are separated or marked off by the above three rivers, namely; North River, New River and Luxapolila River. The divides are from four to six miles wide and from 200 to 300 feet above the level of the main water courses. The widest and highest of these divides, the one between North River and New River, is also the divide between the waters of the Warrior and Tombigbee rivers, and is known as the *Byler Ridge*, from the old Byler road which keeps it, most of its length of 60 miles in this county and the counties on the north and south. The roads of this county which run north and south, or with the divides and water courses, are, as might be suspected, comparatively level and smooth, while those which run across the country, or east and west over the divides and streams, are very hilly and rough.

The topography of the western half of the county, where the stratified *Drift* is the only formation to be seen, is very similar to that of the western part of Marion county where the same formation alone shows, but the eastern half of the two counties, where the Coal Measures occupy the low grounds along the creeks and branches and the Drift the high grounds over the divides, do not possess this same similarity, for the reason that most of the strata of the Coal Measures of the two counties, are quite different. Those of Marion county, as a whole, are lower or nearer the base of the measures and consist, for the most part, of hard sandstones and conglomerates, while those of this county are of the *upper measures* or higher in the series, and are principally of the softer shaly and slaty rocks. We do not find therefore in Fayette county the grandness, wildness, suddeness, and picturesqueness of scenery, that abounds along the streams of Marion county, where deep chasms and high cliffs are the accompaniments of every stream of any considerable size, and where roaring water-falls and murmering cascades are a common occurrence.

The soil, growth and water supply of this county are also similar to those of Marion county and hence they need not be described here.

GEOLOGICAL FORMATIONS.

The geological formations of Fayette county are only two in number, viz: *I. Coal Measures; II. Stratified Drift.*

I. COAL MEASURES.

The Coal Measures of this county may be said to be confined exclusively to the water courses or low-lands east of the Luxapolila River. They become more and more extensive or extend higher and higher up the sides of the divides as you travel eastward, until at the eastern boundary line, they are 200 feet and more in thickness above the drainage level. They are made up principally of the softer rocks, comparatively speaking, of the Coal Measures, namely: shales, slates and slabby and flaggy sandstones.. The general dip of the strata is to the south-west and those east of the divide east of North River appear to dip also towards the east. They are in waves and, at least in the eastern part of the county, have faults. They have never been prospected but little, and as the coal outcrops have never been dug into, except in a few places, and as the natural exposures of the coals are chiefly along the beds of the branches and creeks, mostly under water, it is in but very few instances that we know the exact thicknesses and characters of the different coals and hence our uncertainty as to the number of coal seams. We have also found it very difficult, on account of the thinning out and splitting up of, at the least, many of the coal seams in the western part of the *Warrior coal field*, and our imperfect knowledge of the coal seams of this county, to refer the different coal out-crops or seams of this county to their respective out-crops or seams in other counties, or, in other words, to place the coal out-crops or seams of this county in their proper horizontal positions in a general section of the *Warrior coal field*. The following general section is therefore nothing more than a supposed approximation to a true general section of the strata of the Coal Measures above drainage level in Fayette county :—

Approximate General Section of the Strata of the Coal Measures above Drainage Level in Fayette County.

Measures; along the waters of New River in the southern part of the county	50 ft. to 75 ft. 0 in.
(10) Coal	1 ft. 6 in.
Measures	150 ft. 0 in.
(9) Coal	8 in. to 1 ft. 0 in.
Measures	30 ft. 0 in.
(8) Coal	6 in.
Measures	100 ft. 0 in.
(7) Coal	1 ft. 6 in. to 1 ft. 10 in.
Measures	30 ft. 0 in.
(6) Coal	2 ft. to 3 ft. 0 in.
Measures	80 ft. 0 in.
(5) Coal	4 in. to 8 in.
Measures	50 ft, 0 in.
(4) Coal	10 in. to 1 ft. 6 in.
Measures	20 ft. 0 in.
(3) Coal; Box's Creek, about	2 ft. 6 in.
Measures	60 ft. 0 in.
(2) Coal	1 ft. 3 in.
Measures	15 ft. 0 in.

(1) COAL; thickness undetermined, thought to be two or three feet.......................................2 ft 6 in.
Measures; along the waters of New River in the northern part of the county...................................... 50 ft.

DETAILS.

Considering the measures in an ascending order, we find the outcrops of the two lowest coal seams known of in the county on New River and Turkey Creek, in S. 27 and 28, T. 13, R. 11 W. The outcrops of the upper seam are about 15 inches thick and have an underbed of fire clay, as shown in the banks of Turkey Creek, about six feet above the water, in the E ½ of N. E. ¼ S. 27, T. 13, R. 11 W. Some twenty or twenty-five feet below this outcrop on Turkey Creek, there is said to occur in several places in New River, in the E. ½ of N. W. ¼ of S. 28, T. 13, R. 11 W., coal at least several feet in thickness. These two outcrops of coal are (1) and (2) of the *General Section.*

At *Tucker's ford* across New River, in the N. ½ of S. E. ¼ of S. 28, T. 13, R. 11W., there is some seventy feet of alternating beds of sandstones and shales, that are partly covered by debris and capped with twenty-five to thirty feet of Drift. On Barren Creek, which is the next creek that empties into New River below this ford or below Turkey Creek, there are no outcrops of coal known of except away up near its head or in the S. E. ¼ of S. 34, T. 13, R. 11 W., not far from Dublin P. O., on the Byler road, in the N. E. corner of S. 1, T. 14, R. 11 W., though, below the mouth of this creek, there is reported to crop out along the river in different places for several miles, in S. 7, 18, 19, and 20, T. 14, R. 11 W., two or more seams of coal. In S. 7, an outcrop of coal 10 inches thick is said to show up in a bluff, and below it, some 20 feet, in the bed of the river there is said to be an other seam of coal of two to three feet in thickness. These two seams of coal, (3) and (4) of the *General Section,* also crop out, so it is said, on Moore's Creek, near its mouth, in this same section. Along Box's Creek, near its mouth, there are out-crops of coal which vary in thickness from four inches to two feet six inches and more, and which are believed to belong to the three seams (3) (4) and (5) of the *General Section.*

Commencing at the mouth of the creek, these outcrops of coal are met with as you go up the creek in the following places, in the S. W. ¼ of S. 21, N. W. ¼ of S. 15, N. E. ¼ of S. 14, S. W. ¼ and N. W. ¼ of S. 11, S. E. ¼ of S. 23, S. E. ¼ and N. E. ¼ of S. 24, and S. E. ¼ of S. 13, all of T. 14, R. R. 11 W., and in S. W. ¼ of S, 7, and S. W. ¼ of S. 19, of T. 14, R. 10 W. The supposed upper one of these three seams also crops out in the N. W. ¼ of S. 26, of T. 14, R. 10 W., on the head waters of North River, near *Spencer P. O.*, and in the N. E. ¼ of S. 14 and S. E. ¼ of S. 11, of T. 14, R. 10 W., on the waters of Lost Creek, and in N. W. ¼ of S. 25, T. 14, R. 10 W., on the head waters of Wolf Creek. The lowest and thickest of the above three seams is said, by the black-smiths, wherever it has been tried, to be of the very best quality for working in the shops. At the out-crop in the N. E. ¼ of S. 24, T. 14, R. 11 W., the coal is said to show along the creek for ¼ of a mile.

In the lower five feet of the well, twenty feet deep, at New River Church, in the S. W. ¼ of S. 14, T. 14, R. 11 W., there is, in a gray sandstone, sheets of coal, varying in thickness from ⅛ of an inch to the thinness of a knife blade. At the crossing of Box's Creek in the N. E. ¼ of S. 23, T. 14, R. 11 W., the measures show to a thickness of some 175 feet above the water, with a capping of about 75 feet of Drift. On the side of the road in the S. E. ¼ of N. E. ¼ of S. 29, T. 14, R. 10 W., there is an out-cropping of coal eight inches thick, with an underbed of clay and a cover of heavy slate with seams of flaggy sandstones. This same seam, it is thought, also crops out along a branch near the middle of the west side of the S. W. ¼ of S. 21, T. 14, R. 10 W., about one-half mile north-west of Spencer P. O. At this last out-crop, there occurs about the following section :

Section of Coal Outcrop,
in the S. W. ¼ of S. 21, T. 14, R. 10 W., near Spencer P. O.

(4) *Slate*; cover, hard and sandy.
(3) Coal....................................4 in.
(2) *Fire Clay*..............................1 in.
(1) *Sandstones*; flaggy and slabby, forming the bed of the branch.

Stovall's steam grist mill, at Spencer P. O., uses coal from this outcrop which appears to be some 60 feet or 70 feet or more above North River. The strata between this coal and the bed of the river, so far as seen, consist principally of hard slate and shale with seams of sandstones near the bottom and top. About two miles east of Spencer P. O., Sam. Studdard is said to have dug through a seam of coal 12 inches thick in his well. In the same neighborhood, there are frequent outcrops of coal about 10 inches thick; they are believed to be all of the same seam, (5) of the *General Section*. Still farther east, about one mile, there is an outcrop of coal in the road 6 inches thick; it has an underbed of fire-clay, and, some twenty feet under it, there are flaggy and slabby sandstones which form the bed of a branch. It is doubtless of the same seam as the above.

The country drained by the head-waters of North River and Wolf Creek is very broken. The seams of flagstones which occur in the hard slates and shales near the coal seam, (5) of the *General Section*, both above and below it, are in beds, which usually consist of from four to six layers or courses. These courses of flagstones are each from two to eight inches thick and are frequently of great uniformity and are cut up into strips by parallel perpendicular planes of division every four or five feet apart. In the outcrops of these flagstones along New River, there is a quarry in the E. ½ of S. W. ¼ of S. 17, and one in the S. E. ¼ of S. 7, T. 14, R. 11 W.; the rocks taken from these quarries have been used principally for building chimneys. The quarry in the S. E. ¼ of S. 7, is said to have furnished a great deal of rock and to consist of six courses of flagstones, which range in thickness from the bottom one, which is about 5 ins. thick, to the top layer which is about 2 ins. thick, and are cut up into strips or sections from four to ten feet wide by parallel perpendicular planes of division.

Near the center of S. 29, T. 14, R. 11 W., there is an outcropping of coal; and above it there are large quantities of iron pyrites which glue together, into rough pudding stones, the rounded pebbles of the overlying Drift. In places this conglomeration of iron pyrites and rounded pebbles is covered with a coating of copperas.

After leaving the outcrops of coal near the mouth of Box's Creek, there is no more coal known of along New River until within six or seven miles of Fayette C. H., or in the S. E. ¼ of S. 10 and N. E. ¼ of S. 16, T. 14, R. 12 W., near Mr. Wm. Bird's. At this locality, the coal is said to be overlaid by a seam of *bituminous shale*, from 8 to 10 inches thick. This shale gave on analysis the following results:

Specific Gravity	1.099
Sulphur	1.501%
Moisture, at 110°c	.286%
Volatile Matter	75.688 "
Fixed Carbon	7.284 "
Ash	16.742 "
	100.000

The thickness of the coal reported to be under this shale has never been determined.

At Mr. A. J. Renfro's spring, some three miles north-west of Fayette C. H., or in S. 26, T. 15, R. 13 W., and not a very great ways from the Luxapolila River, there is reported to be coal, though there must be some mistake about this, as the only rocks showing at the spring or, so far as I have been able to see, west of the waters of New River, are of Drift origin.

In a well, between 40 feet and 50 feet deep, at Fayette C. H., the slates of the Coal Measures are said to have been struck. Along New River, under the bridge just east of Fayette C. H., there are beds of flaggy and slabby sandstones. At a spring on Squire G. Legg's place, in the S. W. ¼ of S. 10, T. 16, R. 12 W., there is a smutty outcrop which may lead back to coal, though no rocks were seen around the spring, except those of the Drift. This spring is in a ravine whose sides and bottom is covered with a beautiful growth of ferns.

In S. 11, T. 16, R. 12 W., there is an outcrop of a fine grain gray sandstone, that is composed of three layers or courses. The bottom course is about 4 ins. thick, the top one 18 ins., and the middle one intermediate in thickness between the other two. These rocks crop-out in several localities in the above neighborhood; they are soft, when they are first quarried, but become hard on exposure. They are devoid of any cleavage and work equally well in any direction. They are well suited for building purposes and make very good grindstones for ordinary tools.

In the south-east corner of T. 15, R. 12 W. and the north-east corner of T. 16, R. 12 W., on the head waters of a second Box's Creek, there are several out-crops of coal about 12 ins. thick. The out-crop which is known as the *Crowley Coal Bed*, in the S. E. ¼ of S. E. ¼ of S. 1, T. 16, R. 12 W., was, at the time visited, entirely covered by water and nothing could be seen of it except the few particles of weathered coal which had been left on the bank.

Not far from this last out-cropping of coal, there is a deep old pit which is known as the *Crowley silver mine.*

Along the bed of North Creek, in the E. ½ of S. E. ¼ of S. 35, T. 15, R. 12 W., near Mr. W. E. Chambless, there are several out-crops of coal about 12 ins. thick. These out-croppings were also covered by water and are likely of the same seam of coal as the Crowley bed. The following seems to be an approximate section of the strata at these different coal out-crops:

(3) *Sandstone;* fine grain and of a gray color; in three layers or courses, varying from 4 to 18 ins. thick. About..3 ft. 0 in.

(2) *Slate;* hard and sandy, may contain thin seams of sandstone. About ....25 ft. 0 in.

(1) COAL; about ....1 ft. 0 in.

This coal is believed to be (9) of the *General Section;* it has been surface mined or dug considerably and hauled in wagons to Fayette C. H.; it was used a good deal for sharpening the tools in the building of the Ga. P. R. R.

There is also said to be an out-cropping of coal in the N. W. ¼ of S. 5, T. 16, R 11 W. From Chambless' (S.E. ¼ of S. 35, T. 15, R. 12 W.) eastward, the Coal Measures not only occupy the beds of the branches but extend up the sides of the divides, getting higher and higher as we go eastward and as the capping Drift gets thinner.

Coal is said to show itself at the school house spring, on Mr. J. C. Robinson's land, in the N. E. ¼ of S. 6, T 16, R. 11 W.

Between Dead Water and Clear creeks, there are to be seen some massive sandstones which are rather rare in this portion of the coal field. At Miller's Mill in the S. E. ¼ of N. W. ¼ of S. 2, T. 16, R. 11 W., the bed of Clear Creek is of slabby and flaggy sandstones. North-west of this mill, something better than ¼ mile, on a branch, in the S. E. ¼ of S. E. ¼ of S. 34, T. 15, R. 11 W., there is an out-cropping of coal which is reported to be about a foot thick. Not far from this out-cropping of coal is Geo. Cotton's shaft, 6 ft. x 6 ft., which has been dug to a depth of more than 40 feet in search of the precious metals ; it is said to have been located by the *mineral rod.*

There is said to be an out-cropping of coal on Clear Creek, about 1½ miles below Miller's Mill, and at W. S. Baker's Mill or Factory, which is on this same creek about one mile above Miller's Mill, or in the N. W. ¼ of S. E. ¼ of S. 35, T. 15, R. 11 W., there is, in the creek, an outcropping of coal with a reported thickness of 18 inches. This outcrop appears to dip to the south-west. There is an outcropping of coal in the S. E. corner of S. 36, T. 15 R. 11 W., which is known as the *Ellis (W. A.) coal bed ;* it is reported to be between two and three feet thick. The bottom of this coal is said to be formed of a *hard pan* of iron pirites about one inch thick; the cover, for several feet, is a clayey shale of a dull yellow color, and then, above these shales, a massive sandstone. In the S. W. ¼ of this same section, there is an other out-cropping of coal which belongs to Mr. J. F. Jackson. The above out-crops of coal are likely of the seams from (4) to (8) of the *General Section.*

The *Bailey coal bed* is in the S. W. ¼ of S. E. ¼ of S. 30, T. 15, R. 10 W.; the coal at this bed is said to be twenty inches thick and to be of excellent quality. It is covered for a few feet by a clayey shale and then a massive sandstone; it is about 150 feet above North River and from 15 to 20 feet above the top of a very high bluff of sandstones. This coal may be of the same seam as the Ellis coal bed, though it is more likely of a higher seam.

On *George's branch*, in the S. W. ¼ of S. W. ¼ of S. 16, T. 15, R. 10 W., near North River, and not much above the level of low water in the river, there is an out-cropping of *block coal*, which is about 6 inches thick. Up a branch about 100 yards north-east of this block coal and some 20 to 25 feet above it, there is an out-cropping of an other seam of coal. This seam of coal, on the out-crop, is eight inches thick and is a good, hard coal. It has no regular cleavage, but resembles *cannel coal*, somewhat, in its fracture. Down the river and in the river about one mile below the above out-crops, or in the S. W. ¼ of N. E. ¼ of S. 20, T. 15, R. 10 W., there is the showing of coal which is called the *Deavan's coal bed.* This showing of coal is reported to be between one and two feet in thickness. About 1 mile lower down the river from the *Deavan's coal bed*, there is the Jenkins' coal out-crop, and off from the river, on a branch in the N. E. corner of S. 31, T. 15, R. 10 W., there is said to be more coal. Still lower down the river, or at the site of an old mill in the S. E. ¼ of S. 31, T. 15, R. 10 W., there is said to be coal in the river, as was discovered by driving piles. Just above this old mill site, the river has cut square through a high ridge, and now presents, the very strange sight, along its narrow channel, as it passes through this ridge, of a bluff on each side. This narrow channel through the ridge is not more than 25 feet wide. The ridge is of hard shales with a capping of sandstones over the highest points. At the old mill site, the strata dip to the north-east, though, just below the old mill, they dip to the south-west; they must therefore be in waves from north-east to south-west. There is said to be coal in the river, about one-half mile below this old mill. The *Jackson* *coal bed* is an out-cropping of coal on a branch in the S. E. ¼ of S. 6, T. 16, R. 10 W.; it has been considerably surface worked, and is said to measure 20 inches of good solid coal, without any partings. It is covered for several feet by dull yellow shales and then by sandstones. It dips to the south-west. This coal is likely of the same seam as the Ellis coal bed, which is believed to be (4), *General Section.*

Along North River, near the Ellis and Jackson coal beds, or in S. 36, T. 15, R. 11 W.; S. 1, T. 16, R. 11 W.; S. 31, T. 15, R. 10 W., and S. 5, T. 16, R. 20 W., there are reported to be out-crops of the same coal seam as the Ellis and Jackson beds, and also of a higher seam, which is not quite so thick, and is probably (6) of the *General Section.* In a well and along a branch, on Mr. Wat. Fondrou's place, in S. 28, T. 15, R. 10 W., there are said to be out-croppings of coal which are believed to be of the Ellis seam. In the River, as it passes through the Widow Harvey's land, in the S. W. ¼ of S. 6, T. 16, R. 10, W., there is said to be an out-cropping of coal from 1 ft. 6 ins. to 1 ft. 10 ins. thick. This coal is also likely (4), *General Section.*

Along the road at the bridge or the old *flat ford* across North River, in the N. W. ¼ of N. W. ¼ of S. 7, T. 16, R. 10 W., there occurs the following out-crops:

Out-crops along the Public Road, at the Bridge over North River, in the N. W. ¼ of N. W. ¼ of S. 7, T 16, R. 10 W.

(10)	*Debris, Shale*; about	50 ft. 0 in.
(9)	*Shale, Sandstone*; about	20 ft. 0 in.
(8)	*Debris*; about	50 ft. 0 in.
(7)	*Shale*	10 ft. 0 in.
(6)	COAL SMUT	1 ft. 2 in.
(5)	*Clay*;	8 in.
(4)	*Shale*; about	10 ft. 0 in.
(3)	COAL SMUT	10 in.
(2)	*Shale, Debris*; about	10 ft. 0 in.
(1)	*Sandstone*; slabby and flaggy, forming the bed of the River.	

The coal out-crops of this section are probably of (6) and (7) of the *General Section.* There is reported to be an out-cropping of coal in the river just below the above bridge. About ¾ mile to the south-east of the above bridge, or in a branch on Mr. P. J. Jeffers' land, in the S. E. ¼ of S. 7, T. 16, R. 10 W., there is said to be an out-cropping of coal from 10 to 12 inches thick, which is covered by a bluff of hard sandy shales. At this last coal out-cropping the strata are in waves from north-east to south-west. Mr. John Rodgers has coal on his land in the N. E. corner of S. 5, T. 16, R. 10 W., and Mr. L. B. Harbin has a coal out-crop near the west edge of S. 4, T. 16, R. 10 W.

Coal also crops out in the road near Mr. W. E. Julian's, or in the N. W. ¼ of N. W. ¼ of S. 8, T. 16, R. 10 W., and in the S. W. ¼ of S. 5, T. 16, R. 10 W. These two out-crops are likely of the same seam, which is believed to be of the highest of the coal out-crops hereabouts. In the fork of the roads in the S. E. ¼ of S. 8, T. 16, R. 10 W., there is an out-cropping of coal, which has been considerably surface dug. This coal was felt to a thickness of 8 inches under water, in the old pits, without being able to reach the bottom. It appears to have, near the top, a clay slate parting of about one inch in thickness. It is covered, for four to five feet, with clayey shales, of a dull yellow color, and then by massive sandstones. The strata near this out-cropping, as they do on the Cedar Creek side of the divide between Cedar Creek and North River, dip to the south-east, while those just over the divide, on the North River side, dip to north-west. There is also said to be an out-cropping of good coal on the side of a hill in the S. E. ¼ of S. 9, T. 16, R. 10 W. All of the above out-crops of coal along North River, near the intersection of the lines between T.'s 15 and 16, and R.'s 10 and 11 W., are believed to be of the four seams: (6), (7), (8) and (9) of the *General Section.*

We are indebted to Mr. J. W. Julian for the localities of all of the coal out-croppings which have been given above, of this neighborhood.

In the Tuscaloosa road, south of Berry Station on the Ga. P. R. R., about one mile, or in the S. W. ¼ of S. 20, T. 16, R. 10 W., there is an out-cropping of two seams of coal smut, each about four inches thick, which are separated by about 18 inches of a clay slate. The strata in the south-western part of T. 16, R. 10 W. appear to have a general dip of 4° to 5° to the south-east, though they are also in waves from north-west to south-east. The divide between Tyro Creek and North River is nearly 200 feet above these water courses and is covered with a growth principally of oak and hickory with a few shorf leaf pines. This divide may be said to be made up of hard shales with a base rock of slabby and flaggy sandstones, which forms the beds of the streams. These hard shales often give to the country a peculiar barren and drouthy look. In many localities, on the hills and hill sides, they in spots, are perfectly naked, or have no signs of vegetation, except perhaps an occasional clump of stunted or dwarfed pines.

In the deep cut of the Ga. P. R. R., as it crosses the high divide between the waters of North River and those of Wolf Creek, in S. 1, T. 16, R. 10 W., near the R. R. Station, *Alta*, which is said to be the highest point on the western division of this road, the strata are very irregular and, at many points, appear to be thrown together into a confused pile. In this cut, faults, of greater or less extent, are apparent. At places in this cut, the rocks dip to the south-east, while, in other places, the dip is to the north-east; the general dip is therefore to the eastward. In the end of the cut, which is in Walker county or near the high trestle over a branch of Wolf Creek, there occurs the following section:

Out-crop in Georgia Pacific Railroad Cut,
in the S. W. ¼ of S. 31, *T.* 15, *R*, 9 *W.*

(5)	*Sandstones;* soft and coarse grain	20 ft. 0 in.
(4)	*Shale;* of a dove color	3 ft. 0 in.
(3)	*Slate;* black	from 4 in. to 6 in.
(2)	COAL; out-crop	1 ft. 2 in.
(1)	*Shale*; forming bottom ot cut	8 ft. 0 in.

In (1) there is, in places, about five feet from its top, a seam about 1½ inches thick of cubical coal. In the second high or deep portion of this cut away from the above trestle, or not far from Alta, there is a six inch out-cropping of coal, which is much higher than the coal of the section above. It is in hard slate but has sometimes a gray sandstone underbed and a soft orange micaceous sandstone cover, which becomes, in places, on weathering, nothing more than an orange sandy loam. In the end of the cut, still nearer to Alta, is a hard gray sandstone, of a light gray color, which has black streaks along the planes of stratification, either of coal or coal plant casts, and thin minute seams of cubical coal running through it. This rock, with its thin sheets of coal, is higher in the measure than either of the above out-crops of coal, which are (7) and (8) of the *General Section.* These out-crops of coal in this cut appear to be on the east or south-east side of a great fold and hence they are much higher topographical, than are the out-crops of the supposed same coals to the east or west of this locality.

On the head waters of Tyro's Creek, in the N. W. ¼ of S. 19, T. 16, R. 9 W., there is an out-cropping of coal, about 12 inches thich, which is known as the *Whitson's coal bed.* Much coal was taken from this out-crop for the sharpening of the tools which were used in digging the above long, deep, and rocky cut, on the Ga. P. R. R.. It is believed to be of the same seam as the coal of the following section along the spring branch running from *Boley Springs.*

Section along "Boley Springs" Spring Branch, in the S. W. ¼ of S. 17, T. 16, R. 9 W.

(9)	**Drift**; sand, ferruginous sandstone and conglomerate, and siliceous iron ore	70 ft. 0 in.
(8)	*Shales, Debris*	20 ft. 0 in.
(7)	*Sandstones;* slabby, flaggy, massive, towards the bottom, micaceous. Dips towards the N. E..	15 ft. 0 in.
(6)	*Slate*	1 ft. 6 in.
(5)	**Coal**; bright, laminated, firm, bony coal	1 ft. 0 in.
(4)	*Shale;* seen to a depth of only a few inches.	
(3)	*Debris*	15 ft. 0. in.
(2)	*Sandstone;* massive, especially towards the bottom, coarse grain, and of a dark gray color; forms a perpendicular fall 12 feet high. Dips some 15° to the east of north	15 ft. 0 in.
(1)	**Fault**, *Shale*. Jutting up against the fall or sandstone of (2), is a bluff of shale some 20 feet high. The dip of this shale seems to be very slight; on the north side of the branch, the dip is a little west of north and, on the south side, it is S.	

W. In this shale, especially near the bottom, there are seams, of a few inches in thickness, of a very fine grain, dark colored rock which breaks up into regular slabs, of parrallel sides, from a few inches to several feet in width........100 ft. 0 in.

The shale (1) of the above section was also, in places, striated by regular parallel perpendicular seams, of two and three inches thick, and five and six inches apart, of this fine grain, dark colored rock. These streaks of rocks in the shale ran N. E. and S. W. and looked like endless bricks, standing on their ends. This fine grain rock would doubtless make very good whetstones. In a more southern branch, which empties into the above branch about one-half of a mile from Boley Springs, the sandstones (2) of the above section are some 40 feet to 50 feet thick and lie conformably on the slates (1), which has a dip to the south-west. These sandstones form a prominent ledge around the ridges and frequently cover or form small *rock-houses.* The coal of the above section is believed to be (9) of the *General Section.*

On the head waters of Blue Water Creek, the southern prong of Wolf Creek, in the N. E. ¼ of S. 5, T. 16, R. 9 W., there is said to be an out-crop of coal eighteen inches thick. Some two miles further down Blue Water Cfeek, in S. 10, T. 16, R. 9 W., near Mr. W. N. Aldrich's, there is an out-cropping of coal of which the following is a partial section, as reported by Mr. Aldrich:

Section of Coal Out-crop on Blue Water Creek, in S. 10 T. 16, R. 9 W.

(5) *Slate;* clayey.
(4) COAL..2 ft. 6 in.
(2) *Slate*..4 in.
(4) COAL; as far down as dug into. ... . 1 ft. 6 in.

This coal is believed to be of a higher seam than the Gaines, Patton, etc. beds, Walker county, or (6), *General Section.* It is probably of the same seam as the coal in the Crownover well, etc., to be hereafter described. Up Blue Water Creek a short distance from this last coal out-cropping, this same coal shows again in the bed of the creek, as a bright laminated coal with thin seams of mineral charcoal. It seems to dip to the south.

Some 1¼ miles down Blue Water Creek from the place of the last section, or in the S. E. ¼ of S. 11, T. 16, R. 9, W., there is the out-crop of coal which is known as the *Thos. Handley's bed.* This coal is of undetermined thickness; it projects merely above the water and has a cover of hard shale with seams of sandstone which forms a bluff some twenty feet high. The coal and rocks at this out-crop have a dip to the south or south-west, but, only a few steps farther down the branch, the dip of the dark coarse grain, micaceous, flaggy sandstone, which takes the place of the shale above, or occupies the bed of the branch, is in the opposite direction or to the north-east, showing most plainly a fault in the rocks. This fault may be along the top of a fold. The displacements of the rocks along this fault, is not believed to be very great. The steep side of the shaly bluff above this out-cropping of coal is covered with a beautiful growth of ferns.

Down the creek or south-west from the last coal out-crop ¼ mile, the rocks dip to the south-west, showing that there has been at least one more wrinkle or fold in the rocks. Still farther down the creek, or to the south-west, some ¼ mile, there is a deep hole in the creek, in which there is said to be an out-cropping of coal that has been dug down into some 3 feet to 4 feet. The only rocks which were seen near this hole were loose flaggy sandstones at the foot of a ridge, some 75 feet high, that was capped with loose massive sandstones. Some twenty or twenty-five feet from the top of this ridge, there is a spring which, it is said, never goes dry, and which probably comes from a seam of coal. The coals which were seen along Blue Water Creek are believed to be of the seams (6) and (9) of the *General Section.*

We have now come to the most southern out-crops of coal known of in the county, namely; those on Davis' Creek, in the southern part of the county, in the neighborhood of Davis' Creek P. O. They are about 1 foot 6 inches in thickness and are doubtless all of the same seam of coal, (10) of the *General Section.* They occur in S. 36, T. 16, R. 12 W., in S. 1 and 12, of T. 17, R. 12 W., and in S. 7, T. 17, R. 11 W. This coal is seen in the branches and wells; it has a cover of shale and, at certain out-crops, it is said to be of excellent quality, while, at others, it is reported to be of little value for shop use, on account of the large amount of sulphur in it.

In the N. E. ¼ of N. W. ¼ of S. 36, T. 16, R. 12 W., there is a rock quarry or an out-cropping of a bed of flagstones or *plank rocks* in the hard shales. These *plank rocks* are from two to four inches thick and are cut into strips from four to five feet wide, by parallel seams.

The timber or growth of this part of the county, as a whole, is comparatively small; it consists principally of oak, hickory and short leaf pine.

Coal is said to occur on New River some three miles below Fayette C. H., we doubt it, but if it does, it is doubtless of a seam lower than the one of the coal out-crops last mentioned or it is perhaps of the same coal seam as the Crowley bed, (9) of the *General Section.*

Coal out-crops either have been seen by me or heard of, from reliable authorities, in the following sections. They doubtless occur in other *sections* which are not enumerated below.

Localities of Coal Out-Crops in Fayette County.

Section	21, 27, 28, 35,	Township	13.	Range	11,	West.
"	7, 9, 11, 14, 19, 21, 25, 26, 29, 30,	"	14,	"	10,	"
"	7. 11, 13, 14, 15, 18, 19, 20 21, 23, 24, 29,	"	14,	"	11,	"
"	16, 20, 28, 29, 30, 31, 32.	"	15,	"	10,	"
"	34, 35, 36	"	15,	"	11,	"
"	10, 15, 35	"	15,	"	12,	"
"	5, 10, 11, 17, 19	"	16,	"	9,	"
"	1, 4, 5, 6, 7, 8, 20	"	16,	"	10,	"
"	2, 5, 6, 11	"	16,	"	11,	"
"	1, 36	"	16,	"	12,	"
"	7	"	17,	"	11,	"
"	1, 12	"	17,	"	12,	"

Drift.

The Stratified Drift is the surface formation over at least four-fifth of Fayette county. It is the only formation to be seen west of the waters of New River, and east of that river, it covers all the high lands or divides. It gradually thins out from a thickness above drainage level of between two and three hundred feet, in the western half of the county, to the eastern boundary line where it exists only as a few scattering thin patches.

This Drift consists of rounded cherty and flinty pebbles, sands, clays, ferruginous sandstones and conglomerates and siliceous iron ores. These materials are similar to those of Marion county, under which county, they have been separately and minutely described, and there is no need of a repetition of those general descriptions here. They, with the exception of the sands, seem to increase proportionally as the formation thickens.

The ferruginous sandstones and conglomerates, and iron ores, are to be seen in places only on the tops and near the tops of the divides, and, to them, the divides owe their present heights, and many of them even their existence. The sands, and especially the clays, seem to be most abundant near the bottom of the formation.

Details.

The north-western part of the county is very broken indeed, and the roads, of this part of the county, especially those going east and west, are very rough from loose pieces of ferruginous flagstones of the Drift, which are scattered over them.

These flagtones are used for building chimneys, and seem to answer very well for that purpose.

About ¾ of a mile north-west of old Webster P. O., or Mr. J. H. Sizemore's, in the N. E. corner of S. E. ¼ of S. 6, T. 13, R. 14, W., there is the tallest hill or ridge in that part of the county. It has been preserved to this great height by the presence, near its top, of massive ferruginous conglomerates, which crop out on the north-west side of the hill in high bluffs with rock-houses. These conglomerates, as a general thing, are nothing more than very coarse and rough pudding-stones, though occasionally they are fine grain and hard enough to make very good mill-stones.

Along the waters of New and Luxapolia rivers, the rounded pebbles are especially numerous; they are heaped up in great banks, and contain, in places, some loose pieces of ferruginous conglomerate and iron ore.

In S. 1, T 15, R. 12 W., there is a very high ridge, which is known as *Coat's* or *Ford's Mountain*, and it, like the one mentioned near old Webster P. O., owes its preservation to the capping of massive ferruginous conglomerates. The base of this mountain, up to the first bench, is of the Coal Measures, principally sandstones, and then comes the lofty superstructure of 200 feet or more of Drift material. On the side of this mountain are loose boulders, as large as good size houses, which have been broken off from the high ferruginous conglomerate cliffs of the Drift near the top of the mountain. Over the the top and sides of this mountain, there is much *limonite;* most of it is very siliceous, though some specimens are very good ore.

On the side of this mountain, in the N. E. ¼ of S. W. ¼ of S. 1, T. 15, R. 11 W., there is the so-called *red paint mine.* It is an out-cropping of a seam of ochre about 15 inches thick, which is red in places and yellow in other places, and is almost free from grit.

In the Drifts of this county, there is occasionally seen, especially on the high points, seams, from one to several inches in thickness, of very hard and very red hydric ferric oxide, which are known to the natives as "paint rock." Several specimens of this "paint rock," which were broken off of out-crops along the road on top of the mountain or high divide about three miles west af Spencer P. O., or in the S. E. ¼ of S. 19, T. 14, R. 20 W., gave the following analysis:

Specific gravity	3.111
Peroxide of Iron	50.888%
Alumina	14.081%

Silica	23.475%
Phosphoric Acid	.324%
Undetermined	11.232%
	100.000

On the side of the hill, near the fork of the Pikeville and Jasper road, in S. 21, T. 15, R. 12 W., deep gullies have been washed out, which show in their sides the pebbles and sands of the Drift in regular seams of stratification.

Along the top of the high divide west of Fayette C. H. and the Luxapolia River, there are, in places, considerable accumulations of very good limonite.

At Fayette C. H., the Drift is rather thin, as the shales of the underlying Coal Measures are said to have been struck in a well in the town, which is not more than 40 feet or 50 feet deep, and as the mottled clays, here near the base of the Drift, are exposed in the gullies around the town.

The cuts along the Ga. P. R. R., south of Fayette C. H., were cut through regularly stratified sands and clays of the Drift, and in them were encountered no hard rocks, with the exception of thin sheets of limonite over the clays. These clays are principally of a dove or light gray color.

Near the bridge across New River, just east of Fayette C. H., on the east side of the river, there is a ridge, with a bluff of ferruginous conglomerate cropping out on its side and on the side of the road.

South of the Box's Creek, south-east of Fayette C. H., in S. 15, T. 16, R. 12 W., there is a high ridge with a capping of a great deal of limonite; some of this limonite is in very large boulders, and some of it is of very good quality. On the divide west of Davis' Creek, there is a great abundance of ferruginous sandstone, with a sprinkling of some very good iron ore. These rocks occur in ledges and as loose pieces, broken off from the ledges, These loose pieces make the roads, especially on the hill sides, very rough indeed.

6. WALKER COUNTY.

TOPOGRAPHY, ETC.

The general topographical and agricultural features of this county have been sufficiently described by the State Geologist in his Reports of Progress for the years 1877–78, 1879–80 and 1881–82. They are similar to those of the Coal Measures of Marion, Winston and Cullman counties. The topography is, however, not so varied and striking as in those counties, because, in all of the counties here mentioned these topographical features are due principally to erosion, and in this county the weather resisting qualities of the diffeernt surface rocks or strata are more equalized than in either of the other counties. These surface rocks or strata of this county, nevertheless, as they, as a class, are softer and hence more easily decomposed, have suffered more from denudation than those of the other counties, but yet, since this denudation has more equally effected all of the surface strata in the case of this county than it has done in the case of the other counties, this county is not so broken as the other counties, and has more level and tillable lands than either of them.

The best soils of the highlands of this county are more or less of a grayish color and of a gravelly nature, while those of the low-lands are of a black color and of a candy nature. Both of these soils contain much iron. The angular sandy gravels of the one which have come from the disintegration or breaking up of sandy shales and shaly sandstones, are usually of an orange color from a coating of iron rust, and the black sands and humus of the other are often stuck together into hard masses by this same hydric ferric oxide.

The virgin forest with its large growth of the different kinds of oak and hickory, long and short leaf pine, gum, beech, poplar, cypress, walnut, etc., still covers more than nine-tenths of the county. Of this large growth, the long leaf pine of this county is, on account of its extent and quality, well deserving of a special and repeated mentioning. Besides occurring in nearly all parts of the county, especially in strips and patches, mixed with the other growth, it covers nearly all of that part of the county which is north of Black Water Creek or an area of some hundred square miles north of that creek. This timber is as fine as can be found in this or any other state, and would now yield, we believe, 15,000 cubic feet to the acre of the best of heart pine. The trees are from three to four feet in diameter and are perfectly straight and have their lowest limbs from thirty to seventy-five feet above the ground. This *long leaf pine belt* extends in places up into Winston county, on the north and south of Black Water Creek on the south, but the timber south of the creek, as a general thing, is not near so good as that north of it. These *piney woods* north of Black Water Creek are known as the *flat-woods*; they occupy a high and comparatively level divide which gently slopes towards the south and has occasional hollows and ravines of moderate depths along the branches. The surface is covered with a thick and luxuriant growth of ferns and wild grasses, which make an excellent summer range for cattle. The other large growth of the county, especially the oak, gum and beech, of the bottoms, hollows and ravines, often reach a diameter of five and six feet. The walnuts are few in number, but along the Black Warrior River, in almost inaccessible places, except by water, there were seen several of these valuable trees which were at the least five feet through.

Though this county, as a whole, is tolerably well watered, still, in some portions of it, off the main streams, during very drouthy spells, water gets to be very scarce. It is commonly believed in the county, and experience has proven such to be the case in hundreds of instances without any exceptions, that, whenever a thick seam of coal is struck in a well, plenty of lasting water is insured. This water which accompanies the coal seams, though it is frequently slighly impregnated with iron and occasionally with sulphuretted hydrogen gas, is usually cool and palatable. It is therefore a good drinking water but is not fit for washing or laundry purposes, as the sulphates held in solution render its effects on soap similar to those of *hard water.*

GEOLOGICAL FORMATIONS.

The only geological formations in this county, are, viz : *I Coal Measures, II Drift.*

I. COAL MEASURES.

These measures, to all intents and purposes, may be said to make up the whole county, as the Drift, the only other formation that occurs in the county, covers with a thin coating only a few spots and these of comparatively small area. These measures may be said to be productive in all parts of the county. They consist of *sandstones*, *shales*, *slates*, *stone coals*, and *clays*, with a little *limestone* at least in one horizon in their upper part. These sandstones, shales, slates and clays are similar in many respects to those of Marion, Winston and Cullman counties and hence it is unnecessary to repeat here a lengthy description of them.

As this county is nearer to the center of the *great coal basin* of Alabama, as it originally was, than either of the counties mentioned,the measures in this county are thicker, than they are in those counties, and the hard sandstones and conglomerates at the base of the measures, which form so prominent a part of the surface features of those counties, are here not visible or are below drainage level, notwithstanding that the beds of the larger streams of this county are from two to three hundred feet below the general level of the country. In this county, therefore, the lower and harder rocks or sandstones, occupy a secondary position to the higher or softer rocks or shales. The sandstones were seen in only two places, and very imperfectly in these, to be a *real conglomerate;* though doubtless, including these two points, there is a line of conglomerates which extends clear across the county. As lofty conglomerate bluffs abound just beyond the county, on the north, they may extend a short ways into this county, along Sipsey River, before they sink below drainage level.

The strata, in all parts of the county, have a general dip of a few degrees to the southwest, while, as a rule, those west of the Big Warrior and Mulberry rivers have an additional common dip to the southeast, and those east of these rivers,a similar, though steeper dip, to the northwest. These dips to the southeast and northwest correspond very closely to the run or fall of the larger streams, respectively to the west and east of the above rivers. Local dips are to be seen almost everywhere in the county ; they are principally of waves, which run southeast and northwest; though some of them are of waves which run northeast and southwest and others still are strictly local. These waves are usually long and flat, but sometimes they are short and sharp, with dips of 15° and 20° and altitudes of 10 and 12 feet.

The measures, above drainage level, in this county are much richer in coal than those of Marion, Winston and Cullman counties, and with but a few exceptions, the coal seams are thicker and the coals are better.

As we have gone to no expense of digging or boring, and as most of the strata are very variable and partly covered, and as faults and slides occur, the Coal Measures of Walker county have presented to us a very difficult problem to solve, still we believe that we have a very close approximation to the true solution, especially so far as the *coal seams* are concerned, in the following *General Section* of the strata showing above drainage level in Walker county :

General Section of the Strata of the Coal Measures above Drainage Level in Walker County.

Sandstones; laminated, slabby and flaggy, to general level of the country in the south-eastern part of the county,	25 ft. 0 in.
(16) COAL; rusty on out-crop.......	2 ft. 0 in.
Sandstones ; slaty and massive, laminated. Also slabby and flaggy in places...............................	100 ft. 0 in.

Slate; bluish in color and fossiliferous ....1 ft. 0 in.

(15) Coal; variable thickness..............3 in. to 1 ft. 10 in.

Slate; clayey, and fossiliferous ....2 ft 0 in.

Sandstones; slaty and massive, dark, dove colored and micaceous. Fossiliferous........ ....12. ft. 0 in.

(14) Coal; in two benches with a parting of fossiliferous slate. In bed of river below Fork Shoals....1 ft. 10 in. to 2 ft. 0 in.

Clay; a little shale and slate in upper part...........2 ft. 0 in.

Shales, Sandstones, Limestones; the sandstones are massive, flaggy and slaty; they are also micaceous. The shales are sandy and fossiliferous. The *limestone* was seen only in loose pieces. The shales and sandstones are in alternate beds; they form high bluffs of very hard and compact rocks. From............ . ... 275 to 300 ft. 0 in.

(13)	(c) Coal; in two benches with a parting of slate, some of it resembles *cannel coal.* Van Hoose's upper seam in Franklin's bend, .. 3 ft. 2 in.	Coal; Coal Valley, etc. seam. 4 ft. 0 in.
	(b) *Shales, Sandstones;* about .... 30 ft. 0 in.	
	(a) Coal; it has two thin slate partings, dry and rusty coal on the out-crop, Van Hoose's lower seam in Franklin's bend ....3f. 2 in.	

Sandstones, Shale; the sandstones are slaty, slabby and massive; they are also micaceous and fossiliferous. The shales are both clayey and sandy, and soft and hard, about..20 ft. 0 in.

(12) Coal; with a thin clay covering, about............8 in.

Sandstones Shales; the sandstones are slaty, slabby and massive; they are also micaceous. The shales are fossiliferous and curly, and are of a bluish and orange color....10 ft. 0 in.

(11)	(e) Coal; about....3 in.	Coal; Bradley, Bailey, etc., beds, about.....4 ft. 6 in.
	(d) *Measures;* about... ..14 ft. 0 in.	
	(c) Coal; about .. 2 in.	
	(b) *Measuves;* about.......40 ft. 0 in.	
	(a) Coal; about.. .3 in.	

Shales, Sandstones; may contain a thin seam of *coal* near the top. About.................... . ...150 ft. 0 in.

(10) Coal; about...................... ....1 ft. 0 in.

Sandstones, Shales; the sandstones are slabby and flaggy; the shales are clayey and of a bluish and yellow color ....25 to 30 ft. 0 in.

(9) Coal; *Baker's Upper Bed*..............10 in. to 2 ft. 0 in.

Fire Clay........................ . ...1 ft. 0 in.

Shales, Sandstones. The sandstones are flaggy and slabby and are in seams in the shale. The shales are in places hard, sandy and yellowish, and in other places are soft, clayey, and bluish. The shales are also fossiliferous..........20 ft. 0 in.

(8) COAL; no partings, upper six inches is slaty. *Baker's Lower Bed*; other out-crops are known as the Steedman bed, Stephenson bed, T. W. Davis' bed, Newt. Davis' bed, etc., etc..... ....2 ft. to 3 ft. 6 in.

Shales, Sandstones; the shales are clayey and fossiliferous; they are usually of an orange color, though in places they are bluish and sometimes, when just under the coal, black for a few inches. The sandstones are massive and flaggy......... ....15 ft. to 40 ft 0 in.

(7) COAL; a hard good coal, bony in places, with partings of slate and clay. It is very variable as to thickness and composition. Some of its out-crops are known as the Jagger bed, Townley bed, Kitchen bed, Mt. Carmel bed, Hawthorne bed, etc., etc., all of this county, and as the *New Castle Seam* in Jefferson county...... ....7 ft. 0 in.

Sandstones, Shales. The sandstones are shaly, slabby, and massive; the shales are fossiliferous and of an orange and bluish color...... ....20 ft. to 60 ft. 0 in.

(6) COAL............... .... 1 ft. to 1 ft. 6 in.

Fire Clay...... .. ..1 ft. 0 in.

Shales, Sandstones. The shales are clayey and fossiliferous, the sandstones are slabby and flaggy..........10 ft. to 50 ft. 0 in.

(5) COAL; very hard, little bony, *Mill Creek* seam, 2 ft. 6 in. to...................................... .....3 ft. 6 in.

Sandstones, Shale; the sandstones are shaly, slabby and massive; in places they are very massive and may be *conglomerates.* The shales are hard and sandy. These rocks may contain one or more thin seams of *coal.* They form high bluffs. About......................................150 ft. 0 in.

(4) COAL. ....4 in. to 6 in.

Sandstones, Shales. The sandstones are massive quartzose sandstone and of a brick red color .... 25 ft. 0 in.

(3) COAL. *Mrs. Burton's Upper Bed*.........1 ft. to 2 ft. 0 in.

Sandstones, Shales; the sandstones are slabby, flaggy and massive; the shales are bluish...... ....30 ft. 0 in.

(2) COAL. A hard coal with bright and dull streaks. An excellent coal and of great uniformity as to thickness and composition. Some of its out-crops are known as the *Phillips and Cordell bed, Maclee bed, Jas. Cole's Spring Branch bed, Mrs. Burton's lower bed,* etc. in this county; as the *Beauchamp, Burnett, Thompson, Garrett, McWhirter's, Vaughn's, Matthews',* etc. beds in Marion county; as the *Black Creek beds* in S. 33, T. 11, R. 8 W. in Winston county; as the *Bremen, Acock, Day,* etc. beds in Cullman county; as the *Clifty, Morgan, Gravelee,* etc. beds in Blount county, and as the *Black Creek Seam,* at New Castle, Jefferson county.

Sandstones, Shales, Debris. The sandstones are massive, flaggy, and slabby, and contain false bedding. The shales are bluish and sandy .... 120 ft.

(1) COAL .... 6 in

Sandstones, Conglomerates, Shales. These rocks are believed to contain one seam of *coal*, varying in thickness from 0 to 18 inches. To level of water in Sipsey River, at county line, on the north .... 125 ft.

We are well satisfied that the *Black Creek seam* of New Castle, Jefferson county, is the same as (2) of the section above, and that the *New Castle seam*, Jefferson county, and (7) of the above *General Section* are one and the same.

It can be seen from the above section that some of the coal seams of the county, at certain localities, are split up into parts, and we know that some of them are very much thinner near the western edge of the county than they are in other parts of the county, or that some of them suddenly thin out near the western edge of the county. In the above general section, we have, however, tried to give an average thickness to the different coal seams and strata. The above general section also shows that there are above drainage level in Walker county, at least, sixteen seams of coal which have a total thickness of coal of more than 36 feet. It also shows that seven of these sixteen coal seams are of workable thickness, or are of two feet six inches and more in thickness, and that these workable seams have a total thickness of workable coal of more than 25 feet: In a general way, it may be said that four of these coal seams of the county, from (1) to (4) inclusive, are co-extensive with the county, or cover an area of 880 square miles; five, from (5) to (9) inclusive, extend over the south-western half of the county, or 440 square miles; four, from (10) to (13) inclusive, embrace the south-western quarter of the county or 220 square miles, and the three uppermost ones include only about one township, or 36 square miles, in the extreme southern part of the county.

Allowing 1,000,000 tons of coal per square mile for every foot in thickness, the sum-total of coal in the workable seams within Walker county, is, according to the above, about 10,600,000,000 tons, which would form a solid block of coal more than 10 miles long x 10 miles wide x 100 feet high. Granting that, for various reasons, one-half of this coal of the workable seams in Walker county is not available, which is a most liberal discount for every imaginable cause, there will still remain 5,300,000,000 tons of *mineable coal*, which, with a daily out put of 5,000 tons, can not be exhausted in 3,000 years. The workable coal of Walker county may therefore be said to be practicably inexhaustible, so far as we are concerned.

As a class, these coals are a good average bituminous coal; they burn freely and most of them are well suited for gas making. Nearly all of them contain thin sheets of mineral charcoal, along horizontal planes of stratification, and many of them have perpendicular and parallel planes of division, which cause the coal to break up into cubical and rectangular blocks. Some of them are hard and crumble but little on handling and hence such are well adapted for stocking purposes. Along the horizontal planes of division or stratification of many of these coal seams, there are casts of plants which give to the coals a dull luster and make them appear as if they are slaty, when such is not the case.

Analyses have been made of average samples of many of these coals and will be given in the body and at the end of this report. With but one exception, however, these samples for analyses were taken from the weathered out-crops and hence, though they are truly representatives samples of the different coal out-crops, their analyses do not, in any sense, stand for the true values of the different coals and, at best, merely give their comparative values for certain purposes. Most of these analyses were given by the State Geologist in his reports for the years 1877–1878 and 1879–1880. For want of transporting facilities, no attempts at mining these coals scientifically had ever been made until the summer of 1883, when the *advanced guards* of the western division of the still incomplete Georgia Pacific R. R. reached the county line. Years ago, however, in *ante-bellum* days, hundreds of flat bottom boats, which were built close at hand, are said to have been loaded, during low stages of the water, from the naked out-crops in and near the river and the mouths of the creeks which empty into the river and floated down to Tuscaloosa and Mobile. The river, however, above Tuscaloosa, is not navigable for any kind of boats during low stages of the water, so these barges with their cargoes of coal, staves, etc., had to be tied up until a freshet, when they were cut loose and steered down the swollen streams, with frequent losses and hair breadth escapes as they passed over the different shoals or falls. Recounting the darings and deeds of these hazardous boat trips to market, must be still a source of much pleasure to the older inhabitants along the river or to those who engaged in them, as they never grow tired and never loose an opportunity of reciting them, doubtless greatly magnified from repeated repetitions, to the poor stranger who is compelled to listen to them.

Prof. Tuomey, in his "First Biennial Report" on the Geology of Alabama, printed in the year 1850, gives a description as to how these coals were sometimes raised and how the boats were sometimes loaded from the coal outcrops in the bed of the river and creeks, when the water was rather deep, by what he termed the novel process in the art of mining, namely; diving for coal. When the coal was taken from the outcrops on the land, the cover, usually of loose materials, a few feet in thickness, was thrown off in pits or along trenches, and after all the coal thus exposed had been raised or the covers had become too hard and thick for this kind of mining, new pits or trenches were dug in other places.

Though the Georgia Pacific R. R. has entered this county but a short ways, comparatively speaking, still there are now in active operation along its line four mines which are being worked after the most approved methods of mining by *headings or drifts*, and have a combined out-put of over 700 tons per day. These mines will likely be multiplied, in an increased ratio, as this road is made to penetrate farther into this county.

DETAILS.

The Coal Measures of Walker county may be said to be made up of a series of alternating softer and harder beds, as is shown by the pools and shoals along the river. These softer and harder beds are not, however, in the case of this county, so widely separated in texture as are those of Marion, Winston and Cullman counties. The softer beds consist principally of shaly, slaty, slabby and flaggy sandstones, slates, shales, clays and stone coals and are much the thicker, as indicated by the long pools and slight fall in the river as it runs through this county; while the harder beds are composed mainly of massive rocks and are comparatively thin, as is pointed out by the character of most of the shoals along the river while in this county.

These softer beds are very *productive*, while the harder rocks are almost *barren* of coal; and the former, as they are more easily worn down and washed away, have given, in their outcrops, the general directions to the principal streams of the county, excepting the river, while the latter or the harder beds, being more indestructible, form the cappings to the high divides. In accordance therefore with the above, we find that the coal outcrops of Walker county are confined chiefly to the main water courses or to *three strips or belts of country*, each of from two to four miles wide, which extend clear across the county in a general WNW. and ESE. direction. These *belts* are separated throughout their whole lengths by divides or sections of comparatively high and level lands, each from five to seven miles broad, and are composed mainly of the out-crops of the hard and almost *barren* rocks.

The *coal belts*, with the coal in an ascending order or commencing with the one with the lowest *coals*, are as follows:

Belt 1.—Along Black Water Creek and the Warrior River near the fork of the Sipsey and Mulberry Rivers.

Belt 2.—Along Mill and Lost Creeks to a few miles below Holly Grove, thence down Big Cane and Frog Ague Creeks to the

River, along the River to Tuggles Bend and up and down Horse and Burt Cane Creeks.

Belt 3.—*On the head waters of Wolf Creek, thence down Cane, Lost and Baker Creeks to the River and along the River between the mouths of Lost and Baker Creeks.*

Not included in the above belts, there are a few out-crops of coal in the extreme northeastern part of the county, on the waters of Sipsey River, and in the extreme southeastern corner, on Friley and Short creeks, and the river, and in the central portion, on the high divides between the three main *coal belts.*

1. Coal Out-Crops in the Northeastern Part of the County on the Waters of Sipsey River.

These coal out-crops are all thin and belong to the lowest two seams of coal, above drainage level, in Walker county, or to (1) and (2) of the *General-Section.*

Just over the county line or just within the county of Winston, in the S. E. ¼ of S. E. ¼ of S. 15, T. 12, R. 7 W., there is an outcroption of coal which is called the "*Ray bed;*" it has the following section :

Section at the Ray Coal Bed,
in the S. E. ¼ of S. E. ¼ of S. 15, T. 12, R. 7 W.

(4)	*Debris*, loose sandstones, etc., on side of hill, to level of *piney woods*	4 ft. 0 in.
(3)	*Shaly and slaty sandstones*	5 ft. 0 in.
(2)	*Slate*	2 ft. 0 in.
(1)	COAL; in back of small rock house, made principally by black-smiths in working out the coal. About	1 ft. 0 in.

This coal is thought to be (2) of the *General-Section* or of the same seam as the Phillips and Cordell bed, etc. In the N. W. ¼ of S. E. ¼ of S. 22, T. 12, R. 7 W., there is an other coal out-cropping, less than a foot in thickness, which is either of this same seam or the one above it, (3) of the *Gen-*

eral-Section. This coal (2) of the *General-Section* also makes its appearance at *Tubbs' Spring,* in the N. E. ¼ of S. 8, T. 13, R. 6 W., where it is said to have been dug down into several feet. At two other springs in the S. W. ¼ of S. 10, T. 13, R. 6 W., there are out-crops of coal, likely of this same seam, which are said to measure only 9 inches on the out-crops and are reported by the blacksmiths *to have too much gas* to work well in the shops. The following two sections are not more than one-fourth of a mile apart and, though entirely different, are doubtless of the same strata. They will serve to show how deceiving are merely partial exposures :

1. *Section along Mr. Wm. Lindsey's Spring Branch, in the S. E. ¼ of S. 18, T. 13, S. 5 W.*

(9) *Soil ;* contains angular sandy gravels, from weathering of slates and shales, and the rounded pebbles of the *Drift*..10 tt. 0 in.

(8) *Sandstone;* in seams about three feet thick with about one inch of hard iron sandstone along the planes of stratification. They are soft and friable with many holes washed into them along the planes of division or stratification. They dip to N. W............... ....25 ft. 0 in.

(7) *Sandstone ;* COAL. The sandstones are massive, coarse grained, friable and of a gray and yellow color, they contain thin sheets, reaching ½ inch in thickness, of variable *cubical coal.* The spring rises just over this rock. Seen for.4 ft. 0 in.

(6) *Sandstone ;* friable and of a yellowish color. Upper part shaly..8 ft. 0 in.

(5) *Debris ;* loose rocks. etc. ....4 ft. 0 in.

(4) *Sandstone ;* slabby. coase grained and of a yellowish color. They contain *false bedding* 3 feet thick, and form a high bluff with large *rock houses* and a perpendicular *fall* in branch. At foot of the bluff, they have a dip to S. E. of about 30°, while above and below they dip only about 10' to S. W..30 ft. 0 in,

(3) *Debris,* fallen rocks, etc.................... ...15 ft 0 in.

(2) *Sandstones;* massive and of an orange color. Form high bluffs ....30 ft. 0 in.

(1) *Debris ;* from level of Mill Creek..............40 ft. 0. in.

The *rock houses* of (4) above were inhabited during the late war by deserters and criminals.

2. *Section along Bremen Road from Mr. Lindsey's Residence to Level of Sipley River, in the S. E. ¼ of S. 18, T. 13, R. 5 W.*

(8) *Sandy Loam, Sandstones.* Red sandy loam with a very soft coase grain friable sandstone. These rocks may be of *Drift* origin .... 30 ft. 0 in.

(7) *Sandstones;* in seams coarse and friable .... 10 ft. 6 in.

(6) *Slate, Debris.* The slate has black streaks through it. The debris consists of loose rocks .... 1 ft. 0 in.

(5) *Fire Clay* or *Weathered Clayey Slate;* with thin seams of *lignitic* looking matter .... 5 ft. 0 in.

(4) COAL; visible .... 8 in.

(3) *Fire Clay* ... . 1 ft. 6 in.

(2) *Shales, Sandstones.* The sandstones are of a dark gray color and are in seams in the shales .... 30 ft. 0 in.

(1) *Debris;* loose rocks and soil to level of Sipsey River .... 150 ft. 0 in.

The coals of (7) and (4) respectively of these two sections are not far from being on the same level and are thought to be of the same seam, (2) of the *General Section.* In (1) of this last section, there was in the banks of the river, down next to the water, a very black friable sandstone or a mass of coarse grains of sand that was held together by iron oxide, about 4 feet thick. Mr. Lindsey says that, in the fields bordering on the river here, there were found by the first inhabitants old guns and other implements of warfare and that the trees bore dates of the year 1785. In the bluffs along the river, in the S. W. ¼, S. 20, T. 13, R, 5 W., there is said to be a thin seam of coal of a few inches in thickness. It is (1) of the *General Section.*

II. *Belt* 1. *Coals exposed along Black Water Creek and its Tributaries, and the Warrior River and its Tributaries near the Fork of Sipsey and Mulberry Rivers.*

The *coals* of this belt, with their intermediate strata, are represented in the *General Section* by from (2) to (5) inclusive. They are of four seams, which range in thickness from a few inches to three feet, and contain as good a quality of coal as can be found in the State. The out-crops of these coals show all along Black Water Creek; the longest gap along this creek, without any visible coal out-crops, includes South Lowell and Camack's Mill. These out-crops of coal are, however, most numerous near the Fork of Sipsey and Mulberry rivers.

In the north-western part of the county, there crops out near Mr. W. W. Beard's, in the N. W. ¼ of S. 27, T. 12, R. 9 W., in many places, a seam of coal which has been dug down into, at the least, eighteen inches without getting through it. In one out-crop, in the bed of a branch, it was covered by a soft conglomerate mass, seemingly of clay, humus and rounded pebbles. This cover is doubtless of comparatively recent age. These out-crops of coal we suppose to be of (3) of the *General Section.* At Mr. A. M. McColor's spring, in the N. W. ¼ of S. 19, T. 12, R. 9 W., there shows about six inches of coal, with hard slate cover and underbed. Some twenty-five feet below this out-crop, and several hundred yards east of it, coal has been plowed up in a field. These coals likely belong to (3) and (4) of the *General Section.*

At a spring in the N. E. ¼ of S. E. ¼ of S. 1, T. 13, R. 9 W., on Panther Branch, there is the following out-crop of coal, which resembles (5) of the *General Section:*

Out-crop on Panther Branch,
in N. E. ¼ of S. E. ¼ of S. 1, T. 13, R. 9, W.

(5)	*Sandstones;* in ledges of about eighteen inches in thickness, friable on weathering and of a yellowish color.	10 ft. 0 in.
(4)	COAL; slaty, out-crop	1 ft. 0 in.
(3)	*Slate*	8 in.
(2)	COAL; reported to be good and to be	1 ft. 6 in.
(1)	*Debris* to bed of branch	8 ft. 0 in.

Coal is also said to crop out on the branch about one-fourth of a mile and about one mile above this spring.

A seam of coal, three feet in thickness, is reported to have been dug through in Mr. Leroy Burnett's well, in S. E. ¼ of S. 25, T. 12, R. 9 W., and a seam, which is said to be about two feet in thickness, shows itself in wells in N. E. ¼ of S. E. ¼ of S. 1, T. 13, R 9 W., and N. E. ¼ of

S. W. ¼ of S. 7, T. 13, R. 8 W., and in Buck Creek, in S. W. ¼ of S. 31, T. 12, R. 8 W., and in S. ½ of S. W. ¼ of S. 9, T. 13, R. 8 W. These coal out-crops likely belong to (2) and (3) of the *General Section.*

Opposite to Wm. Keeton's mill, Lucky P. O., in the N. W. ¼ of S. 32, T. 12, R. 8 W., on Black Water Creek, there is a bluff which is composed of two solid sandstones, each, at the least, ten feet in thickness, that are separated from each other by about five feet of shaly rocks. No rocky bluff is believed to occur on Black Water Creek below this one for some twelve to fourteen miles, or until within one-half of a mile of Camack's Mill. The creek, for the greater part of this distance, winds through the *flatwoods*, or *long-leaf piny woods*, and is deep down between almost perpendicular banks of, so far as can be seen, soil with a thick growth of underbrush. There are no first bottoms to this creek while in the *piny woods*, and a strange or peculiar thing about it is that, in passing through these *flatwoods*, frequently no signs are seen of the creek until it is almost under foot.

In a good many places in T. 12, R. 8 W., S's 28, 33 and 34, on Teagle's Branch, there crops out the coal (3) of the *General Section*, from eighteen to twenty-two inches in thickness. This coal has the reputation, with the neighborhood blacksmiths, of being of an excellent quality.

As Teagle's Branch is approached, going westward, the *flatwoods*, or long-leaf pine, gives out, and a growth principally of post oak sets in; the soil also changes with the growth from a more or less clayey nature to one which is much more sandy.

There is said to be an out-cropping of coal in Black Water Creek about one-half of a mile below the mouth of Buck Creek, or in the S. E. ¼ of S. 9, T. 13, R. 8 W.

On Charlie's Creek, in S's 1 and 12, T. 13, R. 8 W., coal crops out in several places, from eighteen inches to three feet in thickness; and, in Black Water Greek, at the mouth of Charlie's Creek, coal is reported to be about two feet in thickness. These coal out-crops on Charlie's Creek, etc., are believed to be of (2) and (3) of the *General Section.*

In the N. W. ¼ of S. 34, T. 12, R. 8 W., on Homes' Creek, one of the head prongs of Charlie's Creek, there occurs the following section :

Section on Homes' Creek, in N. W. ¼ of S. 34, T 12, R. 8 W.

(7)	*Debris;* loose rock, etc., covering steep hill side	50 ft. 0 in.
(6)	*Sandstones*; in slabs from 1½ inches to 18 inches in thickness. Showing in bluff	15 ft. 0 in.
(5)	*Slate*	4 in.
(4)	COAL; in back of *rock-house,* (3) of the *General Section*	1 ft 0 in.
(3)	*Slate*	10 in.
(2)	*Debris*	4 ft. 0 in.
(1)	*Sandstones;* slabby, forming flat bed of branch, coarse grain, and of a yellowish color.	

These rocks have a dip of some 8° or 10° to the southwest.

On an other prong of Charlie's Creek, in the S. W. corner of N. E. ¼ of S. 1, T. 13, R. 8 W., there is reported to be an out-crop of coal which is three feet in thickness. A seam of coal was struck in a well in the N. E. ¼ of S. E. ¼ of S. 2, T. 13, R. 8 W., and also in Mr. J. W. Key's well, in N. E. ¼ of N. E. ¼ of S. 1, T. 13, R. 8 W., where it is covered with about fifteen feet of shale, which contains seams, about one inch in thickness, of a hard compact sandstone of a reddish color.

There occurs in Mr. James B. Sides' well, in the S. W. ¼ of S. W. ¼ of S. 36, T. 12, R. 8 W., the following section:

Section of James B. Sides' Well,
in the S. W. ¼ of S. W. ¼ of S. 36, T. 12, R. 8 W.

(4)	*Clay*; to top of well	12 ft. 0 in.
(3)	*Slate*	1 ft. 6 in.
(2)	COAL; (2) of *General Section*	3 ft. 0 in.
(1)	*Shale ;* containing thin sheets of *coal* and large balls of pyrites. To bottom of well.	12 ft. 0 in.

These thin sheets of coal reach one-fourth of an inch in thickness and break up into cubes. About four feet from the bottom of the well in the shale, there extended across the well a plainly marked specimen of fossil coal plant

(Lepidodendron), some six inches in diameter, of a hard gray sandstone.

Coal occurs along the bed of Black Water Creek, in S. 19, T. 13, R. 7 W., for three-fourths of a mile, about as follows:

Section on Black Water Creek, in S. 19 *T.* 13, *R.* 7 *W.*

(5)	*Soil;* sandy, forming banks of creek	20 ft. 0 in.
(4)	*Fire Clay*, or *Clayey Slate*	1 ft. 6 in.
(3)	*Slate;* of a bluish color, partly under water	4 ft. 0 in.
(2)	COAL; under water, (2) of the *General Section*	1 ft. 6 in.
(1)	*Sandstones*; in bottom of creek.	

On side of hill, in front of Camak's Mill, on Black Water Creek, in the S. E. corner of S. 17, T. 7, R. 13 W., and especially in the bluff just above the mill, there is a fine section of false beddings. This bluff is on the north side of the creek and is perpendicular or overhanging for some twenty feet above the water before it begins to recede or slant off to the level of the country, some fifty feet above. It shows in its face three seams, each of about eighteen inches in thickness, of falsely bedded slabby sandstones which are from an inch to three inches in thickness, while the rest of the bluff is of thick flagstones and massive sandstones. The general dip of the rocks in the bluff is apparently some 10° to the S. W. while those of the *false beds* are some 30° to the S. W. These seams of falsely bedded rocks are about equally distant apart or they divide the bluff up into so many equal parts; they are continuous, or there are others of them above the bluff, as shown by their occurrence on the side of the hill in front of Camak's Mill.

On the west branch of Spring Creek, in the S. E. ¼ of S. W. ¼ of S. 31, and in the S. E. ¼ and near the centre of S. 29, and in the N. W. ¼ of S. 20, all of T. 12, R. 7 W., there are out-croppings of coal which are said to measure from ten inches to fifteen inches in thickness. They are of the seam, (3) *General Section.*

There are no out-croppings of coal known of along Black Water Creek from South Lowell to a mile or so above Camak's Mill.

In digging a well at South Lowell, there is a said to have been gone through a gray sandstone with pebbles, or a conglomerate, and, at 38 feet below the surface, one-half of an inch of coal.

Between South Lowell and Jasper, there is a fine growth of young pines from eighteen inches to twenty inches through. In the bed of a creek about one mile east of South Lowell, or in the S. E. ¼ of S. 10, T. 13, R. 7 W., there are said to be out-croppings of coal. They are likely of the same seam as (4) of the *General Section.*

At Wallston's Mill, on Black Water Creek, in the N. W. corner of S. 24, T. 13, R. 7 W., the following section occurs:

Section at Wallston's Mill, in N. W. ¼ of N. W. ¼ of S. 14, *T. 13, R* 7 *W.*

(10)	*Debris;* covering a gentle rise to general elevation of country	25 ft. 0 in.
(9)	*Sandstones*; massive and of a red color; highly inclined or slanting as if of a slide, though appearing to have a slight dip to N. W. Bluffy	40 ft. 0 in.
(8)	*Debris;* loose rock	30 ft. 0 in.
(7)	*Shale;* showing about	3 ft. 0 in.
(6)	COAL; much weathered; it may not be exactly in place. It is (3) of the General Section. The out-crop measures	1 ft. 0 in.
(5)	*Shale*	10 ft. 0 in.
(4)	*Sandstones;* shaly and slabby, dipping seemingly a little to S. W.	15 ft. 0 in.
(3)	*Shales*; sandy with seams of sandstone	5 ft. 0 in.
(2)	*Slate*	3 ft. 0 in.
(1)	*Sandstones;* slabby and shaly, of a dark gray color, form flat bottom of creek. Showing	3 ft. 0 in.

Though the strata along Black Water Creek above Camak's Mill and below South Lowell are the same, they appear very different and the country is entirely different. Below South Lowell, the creek is at least 150 feet below the general level of the country and usually has two high bluffs of massive sandstones on each side of it, one above the other, which are separated by a steep slant, covered with loose rocks, etc. At *Jno. Pain's coal bed* on Black Water Creek, near the center of S. 24, T. 13, R. 7 W., there occurs the following section:

Section at Jno. Pain's Coal Bed, in S. 24, *T.*.13, *R.* 7 *W.*

(6)	*Debris;* to level of country above	25 ft. 0 in.
(5)	*Sandstones;* massive, forming a high bluff	60 ft. 0 in.
(4)	*Debris;* loose rock, covering slant	40 ft. 0 in.
(3)	*Slate;* of a bluish color	4 ft. 0 in.
(2)	COAL; slaty in upper part, (2) of the *General Section*	1 ft. 11 in.
(1)	*Slate;* down to level of water	6 in.

This coal seems to dip some 8° to the S. W. Near the center of S. 19, T. 13, R. 6 W., coal shows along the bed of Blue Water Creek for a hundred yards or more, about as follows :

Section on Blue Water Creek, in S. 19, *T.* 13, *R.* 6 *W.*

(7)	*Soil, Debris;* to general level of the country	15 ft. 0 in.
(6)	*Sandstones;* massive, coarse grain and of a reddish color. Form a high bluff	40 ft. 0 in.
(5)	*Debris*; loose rocks	50 ft. 0 in.
(4)	*Sandstones;* massive, forming bluffs with rock-houses in the underlying slabby sandstones	40 ft. 0 in.
(3)	*Shale, Debris*	60 ft. 0 in.
(2)	COAL; under water, (2) of the *General Section*	2 ft. 0 in.
(1)	*Slate;* in bottom of Blue Water Creek.	

The rocks of this section have a slight dip to the southwest. From the above seam of coal, there was taken a ball of pyrites as large as one's head. The bed of Black Water Creek between these two last sections is very rough indeed, with loose boulders of massive sandstones which have fallen from the bluffs above. It also had scattered along it loose lumps of coal. The scenery along Black Water Creek throughout this portion of its course, is very wild and picturesque. On some of the high points, there were seen a few perfectly naked places, ten and twelve feet in diameter, without any signs of vegetation, which were said to have been the spots where lightning had struck. The same magnetic causes, perhaps, which induced the lightning to strike hereabouts so frequently, caused the *mineral hunters, with their mineral rods,* to locate their *gold, silver* and *lead mines* in the same neighboroood.

At Tubb's Springs in the N. E. ¼ of S. 8, T. 13, R. 6 W., there is an out-cropping of coal with soil just over it and then an orange sandstone. At an other spring in the N. E. corner of S. 27, T. 13, R. 6 W., at the head of a branch, there is the following out-crop:

Section at a Spring, in S. 27, T. 13, R. 6 W.

(7)	*Soil;* made up of sand and angular sandy gravels,	10 ft. 0 in.
(6)	*Sandstones;* massive, contains seams of stratification four and five feet apart; of an orange color. Forms bluffs,	20 ft. 0 in.
(5)	*Debris;* loose rock	10 ft. 0 in.
(4)	*Sandstones;* massive orange sandstones, friable in places and in other places so hard as to strike fire with a hammer. Form a bluff	20 ft. 0 in.
(3)	*Debris, Sandstones;* the debris covers, partly at least, a slabby sandstone of a yellow color	40 ft. 0 in.
(2)	Coal; (2) of the *General Section*	2 ft. 6 in.
(1)	*Clay* or *Clayey Slate.*	

The dip of this coal seemed to be 8° or 10° to the south-west. There is said to be an out-crop of coal in Black Water Creek in the southern part of S. 34, T. 13, R. 6 W.

The long leaf pine, north of Black Water Creek, gradually dies out in the south-eastern part of T. 13, R. 6 W. and a growth, principally of post and red oaks and short leaf pine, takes its place. Near Mr. Alexander Black's, in the S. W. ¼ of S. 9, T. 14, R. 6 W., a seam of coal shows in a spring branch and in a well; it is covered by slate and is said to be about three feet thick. It is doubtless the same as (5) of the *General Section.* Coal is reported to be in a well in S. 17, T. 14, R. 6 W.

At a spring in the N. W. ¼ of S. 15, T. 14, R. 6 W., there is an out-cropping of coal as follows:

Section in the N. W ¼. of S. 15, T. 14, R. 6 W.

(4)	*Debris*	40 ft. 0 in.
(3)	*Sandstones;* slaty and shaly, showing	6 ft. 0 in.
(2)	*Slate*	4 ft. 0 in.
(1)	Coal; dug down into, without getting through it.	1 ft. 2 in.

This coal has been much used by the neighborhood blacksmiths and pronounced by them to be of excellent quality. It is believed to be (5) of the *General Section.*

In N. W. ¼ and S. E. ¼ of S. 15, T. 14, R. 6 W., under bluffs along Black Water Creek, there occur thin out-crops of coal, similar to the following out-crop of Mr. W. W. Wilson's bed on Poley's Creek, in S. W. ¼ of S. 15, T. 14, R. 6 W.

Section at W. W. Wilson's Coal Bed, on Poley's Creek, in the S. W. ¼ of S. 15, T. 14, R. 6 W.

(7)	*Sandstones, Shale, Debris;* to the top of a very high ridge.	175 ft. 0 in.
(6)	*Sandstones;* massive and slabby, forming bluff.	25 ft. 0 in.
(5)	COAL; good, jutting right up against hard sandstone. Believed to be (4) of the *General Section*	8 in.
(4)	*Slate*	4 in.
(3)	COAL; good	2 in.
(2)	*Slate*	1 ft. 0 in.
(1)	*Sandstone;* slabby and of a dark gray color, in bed of Poley's Creek.	

The rocks forming the bluff over this coal, dip some 10° to the south-west. The coal has been washed out so far back under the bluff that it can with difficulty be reached. There are out-crops of coal in the S. W. ¼ of S. 15, T. 14, R. 6 W., and under a bluff along Black Water Creek and in a well in S. 10, T. 14, R. 6 W.

In a gully, on the side of the road, just north of Bartonville ⋈ Roads, and some twenty-five feet above the level of the ⋈ Roads, and about thirty-five feet below the top of the ridge on the north, there is an out-cropping of coal, in the shale, which is thought to be (6) of the *General Section,* and is seemingly about 12 inches thick. These shales or shaly rocks, here near Bartonville, are highly developed; they show to a thickness of nearly a hundred feet, and often form, where the large growth has been cut off, especially along the roads, perfectly barren or naked places over considerable areas. A seam of coal is said to occur in the well at the church near Sander's Ferry; it is doubtless the same seam as that just above the Bartonville ⋈ Roads.

Section of Out-crops along the Road Leading Down to Sander's Ford on Warrior River from BartonviUe X Roads.

(9) *Sandstones, Slates, Debris;* forming a high ridge southwest of Sander's ferry. They are said to contain, at the least, one thin seam of coal........................ 125 ft. 0 in.

(8) Coal; in gully on side of road just north of Bartonville X Roads. Supposed to be about ....1 ft. 0 in.

(7) *Shale*.......................................20 ft. 0 in.

(6) *Sandstone;* slabby and shaly and of a dove color; the slabs are one and two inches thick ....7 ft 0 in.

(5) *Sandstone;* coated with iron, in seams three and four inches thick.............................. 3 ft. 0 in.

(4) *Shale*.................................... 10 ft. 0 in.

(3) *Sandstones;* massive, slaty and shaly; in stratified seams; of a dark, dirty or mouse color. Form a bluff....15 ft. 0 in.

(2) *Debris;* believed to cover the coal (5) of the General Section.......................................22 ft. 0 in.

(1) *Sandstones;* hard and coarse grained, streaked with gray, yellow and red stripes; form Sander's Shoals

In the bed of the river, just below Sander's ferry, the supposed coal of (2) above is said to crop out, and on the side of the ferry road, east of the river, some 75 feet or more above the river, there is a thin showing of coal in the following section:

Section of Out-crop on Side of Sanders' Ferry Road, in the N. E. ¼ of S. 26, T. 14, R. 6 W.

(7) *Red Sandy Loam;* seemingly of *Drift* origin, to top of hill, about.......................................50 ft. 0 in.

(6) *Clay, Slate;* plastic, when wet; mottled, with yellow and light blue colors and streaks of red .... 4 ft. 0 in.

(5) Coal; slaty and bony, (6) of the General Section....4 in.

(4) *Slate;* with yellow, red and blue streaks. .... 6 in.

(3) *Slate;* of a deep blue color, showing.............1 ft. 6 in.

(2) *Debris;* to the *bench* below, about ....15 ft. 0 in.

(1) *Rounded Flint Pebbles of Drift;* covering bench at foot of hill.

At the crossing of Black Water Creek by the old Baltimore road, we find the following out-crop along the road:

Out-cropping along the Baltimore Road, at the Crossing of Black Water Creek, in the N. W. ¼ of S. 23, T. 14, R. 6 W.

(20)	*Debris;* believed to cover shales	25 ft. 0 in.
(19)	*Shales;* sandy and of a yellowish color	20 ft. 0 in.
(18)	COAL; this is believed to be of the same seam as that seen in gully near Bartonville X Roads. Out-crop	8 in.
(17)	*Sandstones;* slabby	12 ft. 0 in.
(16)	*Shales;* sandy	3 ft. 0 in.
(15)	*Sandstone;* ledge, very hard	6 in.
(14)	*Shale;* sandy	10 ft. 0 in.
(13)	*Sandstone;* soft and friable, out-crop	6 ft. 0 in.
(12)	*Shale*	15 ft. 0 in.
(11)	CONGLOMERATE; hard, reddish gray sandstone with pebbles. Showing	4 in.
(10)	*Debris*	3 ft. 0 in.
(9)	*Sandstone;* coarse grain and friable, of a yellow color	2 ft. 0 in.
(8)	*Shale, Sandstone;* sandy and of a yellow color	25 ft. 0 in.
(7)	COAL; (3) of *General Section*	1 ft. 2 in.
(6)	*Clay or Clayey Shale,* with thin irregular seams of a weathered shaly coal	8 in.
(5)	COAL; outcrop about	1 ft. 0 in.
(4)	*Clay or Clayey Slate;* much weathered	6 in.
(3)	*Sandstone;* coarse grain, and of a yellowish and gray color. Bluff rock	25 ft. 0 in.
(2)	*Sandstones;* falsely bedded, slabby sandstones of four and six inches in thickness. Dip about 30° to S. W.	3 ft. 0 in.
(1)	*Sandstones;* hard, coarse grain sandstones of a yellow collor, forming shoals in Black Water Creek, in stratified seams of twelve and fourteen inches in thickness. Showing	2 ft. 0 in.

These out-crops are badly weathered and will have to be taken with a full grain of allowance.

At Bank's Mill, on Black Water Creek, about one-fourth of a mile up the the creek from the above ford, there is, in the bed of the creek, a dark coarse grain sandstone, which is cut up by regular parallel perpendicular seams, that can be seen to extend clear across the creek. There is said to be an outcrop of coal near the mouth of Black Water Creek, about low water level. At *Dunn's coal bed,* in S. W. ¼ of S. 18, T. 14, R. 5 W., there is to be seen the following section :

Section at Dunn's Coal Bed, in S. W. ¼ of S. 18, T. 14, R. 5 W.

(10)	*Soil.*	
(9)	*Slate*	
(8)	COAL; (4) *General Section.* Outcrop	4 in.
(7)	*Sandstone, Debris;* the sandstone is massive	50 ft. 0 in.
(6)	*Sandstone;* slabby	6 ft. 0 in.
(5)	*Sandstone;* shaly. Showing	4 ft. 0 in.
(4)	*Debris*	5 ft. 0 in.
(3)	*Slate;* showing	3 ft. 0 in.
(2)	COAL; (2) of the *General Section.* Out-crop	1 ft. 1 in.
(1)	*Slate, Debris;* to level of low water in river	8 ft. 0 in.

Along a spring branch in the S. E. ¼ of S 19, T. 14, R. 5 W., there was seen an out-cropping of coal of unknown thickness, which was about twenty feet above the level of water in the river.

Near the Fork of Sipsey and Mulberry rivers, on both sides of the Big Warrior River and in the Fork, the coal (2) of the *General Section* or the *Black Creek Seam* of *New Castle, Jefferson county*, crops out in a great many places. The coals (3) and (4) of the *General Section* also crop out in this neighborhood.

In the *Burton Bend*, the two seams (2) and (3) of the *General Section* make their appearance, respectively, in the outcrops which are known as *Mrs. Burton's Lower* and *Upper Beds.* The *lower bed*, where it crops out in the bed of a branch, in a field, in the N. W. ¼ of S. 29, T. 14, R. 5 W., is not more than six feet above low water in the river. The *upper bed* shows in the S. W. ¼ of S. 20, T. 14, R. 5 W., some 25 feet above low water in the river. The *upper bed* in this out-crop, is said to be about 2 feet thick, though, at the time visited, only the upper 10 inches of coal could be seen. It is just under a hard slate cover. This seam also shows just across the river in Mr. M. D. L. Sanders' coal bed, in the S. W. ¼ of S. 29, T. 14, R. 5 W., where it is reported to be two feet thick. The following analysis of a sample that was taken from Mrs. *Burton's upper bed* will show the character of this coal :

Specific gravity	1.318
Sulphur	3.070
Moisture	2.052
Volatile Matter	38.078
Fixed Carbon	55.265
Ash	4.605
	100.000

The above analysis shows this coal to be a very good coal, notwithstanding that the sample analyzed was taken from the weathered out-crop.

A little higher up the river; on the east side, the seam (2) of the *General Section*, crops out on *Coal Bed Creek*, in the S. W. ¼ of S. 28, T. 14, R. 5 W., in the famous *Phillips and Cordell's* or *Phillips and Camak's Coal Bed.* In this bed, it is reported to be two feet six inches in thickness. The main out-crop, or the one that has been principally worked, is some half mile from the river, but coal is said to show along the creek all the way to the river and in the bed of river at the mouth of the creek. All of these out-crops are of this same seam, the river, at this point, occupying the bottom of a synclinal trough. This is a good, hard, firm coal, free from all slate and clay partings. From these out-crops along Coal Bed Creek and in the river, many boat loads of coal are said to have been raised years ago, in *ante-railroad* times in Alabama, during low stages of the water, and floated, on high tides, down to Tuscaloosa, Mobile and other markets on the river. The immediate cover to this coal is a hard yellowish slate which is full of impressions of fossil coal plants. On this same Coal Bed Creek, some three-fourths of a mile above the Phillips and Cordell bed, and some 20 feet to 25 feet higher, there is an out-cropping of coal which must be of the seam (3) of the *General Section.* This coal out-crop is reported to be one foot six inches thick. There is also an out-cropping of coal at *Bowen's Spring*, near the center of S. 33, T. 14, R. 5 W., which is doubtless of this same seam, (3) of the *General Section.*

About one mile north of the Phillips and Cordell coal bed, there is in the *Marbee Bend*, near the center of S. 21, T. 13, R. 5 W., an other out-cropping of the same coal or (2) of the *General Section*, in what is known as the *Macbee coal bed.* The coal at this bed is also about 2 feet 6 inches thick and has no partings and is of good quality. It has the massive, fossiliferous, yellow slate cover, with, some 25 feet above the coal, shabby and massive quartzose sandstone.

Still higher up the river, near "*Old Warrior Town*," in the S. W. corner of S. 22, T. 14, R. 5 W., in the banks of a branch, about 100 yards from where it empties into *Old Town Creek*, one mile from the river, there is the following out-cropping of this same coal, (2) of the *General Section*, in what is known as the *Jack Phillips coal bed.*

Section at Jack Phillips' Coal Bed,
in the S. W. corner of S. 22, T. 14, R. 5 W.

(6)	*Debris;* soil with loose massive rocks.	
(5)	*Slate;* hard and compact, of an orange color	...4 ft. 0 in.
(4)	*Slate*; soft, argillaceous, and of a bluish color	....1 ft 6 in.
(3)	*Clay;* thin streak, about	½ in.
(2)	COAL; no parting, about	...2 ft. 0 in.
(1)	*Slate* ; of a bluish color forming bottom of branch	

This outcropping does not come up to the average thickness of 2 feet 6 inches of this seam of coal. The rocks at this bed are dipping to the N. W. Seemingly some 25 feet to 30 feet higher than the Jack Phillips bed, there is in the N. W. ¼ of S. 3, T. 15, R. 5 W. the *J. M. Phillips coal bed.* The coal at this last bed is said to be 2 feet 4 inches thick and to be of an excellent grade of coal. The rocks around this bed also dip to the N. W. It is of the same seam as the Jack Phillips' coal bed, etc., or (2) of the *General Section.*

Squire Jack Phillips, now of a ripe old age, whose house stands on the site of the ancient Indian village of "*Old Warrior Town*," says that Black Warrior, Chief of the Cherokees, lived at this village, some 50 years ago, at the time he was killed, by treachery, in a hand to hand combat, near the town, with Capt. Brown, a half-breed and a commander of the Creeks who were friendly to the whites.

Across the river from the *Machee bed,* there is an other outcropping of the coal (2) of the *General Section,* in the S. W. ¼ of N. E. ¼ of S. 21, T. 14, R. 5 W., in what is called the *Jas. Cole's spring branch coal bed.* The coal at this outcropping has a fine appearance and, as the State Geologist states in his report for the year 1879-1880, resembles very much the *English Cannel Coal* This coal out-cropping is included in the following section:

Section at the Mouth of Jas. Cole's Spring Branch, in the S. W. ¼ of N. E. ¼ of S. 21, T. 14, R. 5 W.

(5)	*Sandstone;* massive, coarse grained, bluff making rocks	30 ft. 0 in.
(4)	*Debris;* loose rocks	40 ft. 0 in.
(3)	*Slate;* showing about	10 ft. 0 in.
(2)	COAL; said to be	2 ft. 4 in.
(1)	*Sandstones, Debris;* the sandstones are shabby and are in stratified seams of about six inches thickness. They are of a dark gray color	15 ft. 0 in.
	Debris; to low water level in river. About	15 ft. 0 in.

Boat loads of coal have been taken from this out-cropping and floated down to Mobile. At the head of the above branch, or at Jas. Cole's Spring, in the N. E. ¼ of S. 17, T. 14, R. 5 W., there occurs the following natural exposure:

Section at Jas. Cole's Spring, in the N. E. ¼ of S. 17, T. 14, R. 5 W.

(6)	*Debris;*	20 ft. 0 in.
(5)	*Sandstones;* shabby	10 ft. 0 in.
(4)	*Slate*	14 ft. 0 in.
(3)	*Debris*	10 ft. 0 in.
(2)	COAL: thought to be thin.	
(1)	*Debris.*	

This seam of coal must be about a hundred feet above the one near the mouth of the branch. It is likely (4), *General Section.*

In the N. W. ¼ of N. E. ¼ of S. 21, T. 15, R. 5 W., the following out-crop can be seen :

Out-Crop in the N. W. ¼ of N. E. ¼ of S. 21, T. 15, R. 5 W.

(8) *Debris:* to top of hill .... 50 ft. 0 in.
(7) *Sandstones*: out-crop soft and friable and of an orange color. Showing .... 4 ft. 0 in.
(6) *Clay or Clayey Slate*; yellowish .... 2 ft. 0 in.
(5) *Slate*; bluish .... 3 ft. 0 in.
(4) Coal; out-crop .... 1 ft. 3 in.
(3) *Slate;* bluish .... 8 ft. 0 in.
(2) Coal; very shaly .... 2 in.
(1) *Slate*; bluish

This coal is believed to be of the same seam as Mrs. Burton's upper bed, (3) of the *General Section.*

The coal (2) of the *General Section* crops out in the S. W. ¼ of N. W. ¼ of S. 22, T. 14, R. 5 W., on the side of a hill and in a pit dug by Mr Montieth of South Lowell, in search for silver or lead. It is about forty feet above low water in the river and is said to be about three feet in thickness. Along a bluff, on the southwest bank of the Sipsey River, in the southern part of S. 16, T. 14, R. 5 W., there is the following exposure :

Section in S. E. ¼ of S. 16, T. 14, R. 5 W.

(3) *Sandstones*, Drift; the sandstones are of *Coal Measures*. The capping *Drift* consists of rounded flint pebbles and of red loam .... 40 ft. 0 in.
(4) *Sandstones*: a slabby, gray, carbonaceous sandstone and a slabby yellow sandstone. .... 25 ft. 0 in.
(3) *Shale*; about .... 15 ft. 0 in.
(2) Coal; thickness undetermined
(1) *Sandstones, Debris*; sandstones, shaly on banks and of a dark gray color in the river. To bed of river, about .... 75 ft. 0 in.

The coal (2) of this section is some 25 feet to 30 feet higher than the out-crop of coal near the Fork or in Mr. Montieth's pit, which seam of coal, in the above section, must be covered by the debris of (1); hence (2) of the above section must be of the seam (3) of the *General Section.*

The Black Creek seam, (2) of the *General Section,* again shows itself in the N. W. corner of S. 16, T. 14, R. 5 W., where it appears as follows :

Section in N. W. ¼ of N. W. ¼ of S. 16, T. 14, R. 5 W.

(3)	*Debris ;* loose massive or bluff sandstones	30 ft. 0 in.
(2)	*Slate ;* showing	5 ft. 0 in.
(1)	COAL ; slaty, badly weathered	1 ft. 4 in.
	COAL ; good, badly weatherod	1 ft. 4 in.

It also crops out in the N. E. ¼ of S. 17, T. 14, R. 5 W., where it is not so badly weathered as that of the last section, and hence looks much better. The coal from this last out-cropping has been used for a long time by the neighborhood blacksmiths; it is a hard, good coal, with bright and dull streaks, and has a cover of sandy slates, with the loose massive bluff rocks on the hill side above. It again crops out in the *Drummond coal bed,* in the N. E. ¼ of S. 5, T. 14, R. 5 W., where it is said to be three feet six inches thick. On top of the divide, not far from the *Drummond coal bed,* there is a sink.

In the Fork of Sipsey and Mulberry rivers, there are several out-crops of this coal, (2) of the *General Section ;* two or more of these out-crops occur in S's 33 and 34, T. 13, R. 5 W. They are about two feet four inches thick. At an out-cropping in S. 34, the coal is covered by slabby sandstone, and has an underbed of clay or clayey slate.

In the Jasper and Arkadelphia road, near Squire Wm. Gravelee's, we find this coal in the following badly weathered out-crops :

Out-croppings near Squire Wm. Gravelee's,
in the N. W. ¼ of S. E. ¼ of S. 34, T. 13, R. 5 W.

(7)	*Loam* ; of an orange color, believed to be the result of disintegration of orange sandstones and clayey shales	25 ft. 0 in.
(6)	*Fire Clay* : showing	2 feet or 3 ft. 0 in.
(5)	*Sandstones, Slates, Debris*	50 ft. 0 in.
(4)	*Shale*	20 ft. 0 in.

(3)	COAL; said to be	2 ft. 8 in.
(2)	*Slate;* clayey.	
(1)	*Debris*; to level of Mulberry River, about	175 ft. 0 in.

Coal is said to occur here in the Mulberry River; it is likely of the thin seam, (1) of the *General Section.*

Of the numerous out-crops given of the *Black Creek seam,* (2) of the *General Section,* near the Fork of Sipsey and Mulberry rivers, analyses have been made of average samples of the Phillips and Cordell's bed, James Cole's spring branch bed, Jack Phillips' bed, and of a bed in the Fork, one-half of a mile north-west of Squire Gravelee's. These analyses are as follows:

	(1)	(2)	(3)	(4)
Specific Gravity	1.290	1.263	1.268	1.264
Sulphur	.649	.988	.593	.548
Moisture	3.098	1.700	4.047	2.081
Volatile Matter	34.552	36.128	34.193	31.951
Fixed Carbon	60.745	60.591	60.698	64.337
Ash	1.605	1.481	1.062	1.631
	100.000	100.000	100.000	100.000

No. 1, from Phillips and Cordell's bed.
No. 2, from James Cole's spring branch bed.
No. 3, from E. J. Phillips' bed.
No. 4, from bed in Fork, in S. 34, T. 13, R. 5 W.

Three of the above analyses were given by the State Geologist in his report for 1879–80. They all show a remarkable purity of coal for out-crops, and go to prove that this coal must be of the very best quality within, away from the out-crops.

III. Belt 2.—Coals exposed on Mill Creek, Upper Lost Creek, Big Cane Creek, Frog Ague Creek, Horse Creek, and Burnt Cane Creek, and along the Warrior River between the Baugh Bend and the Tuggle Bend.

From (5) to (10), inclusive, of the *General Section,* will be a general section of the strata above drainage level of this, the *mieddl coal belt.* This belt is the most productive of the three coal belts, in both the number of coal seams and coal out-crops. As can be seen from the *General Section*, it includes seven seams of coal, which range from one to seven feet in thickness.

Commencing with the coal out-crops on the head-waters of Lost Creek, we get the following, as a general section of the strata exposed near *Kansas P. O.* (Mr. T. L. Burton's), in the S. W. ¼ of S. W. ¼ of S. 19, T. 13, R. 9 W.:

General Section of the Out-crops near Kansas P. O., in S. W. ¼ of S. W. ¼ of S. 19, T. 13, R. 9 W.

(14)	*Shales, Sandstones, Debris;* to general level of country	20 ft. 0 in.
(13)	COAL; about	10 in.
(12)	*Fire Clay;* about	2 ft. 0 in.
(11)	*Shales, Sandstones;* about	20 ft. 0 in.
(10)	COAL	2 ft. 8 in.
(9)	*Slate*; clayey, not more than a foot or so	1 ft. 6 in.
(8)	*Shales, Sandstones*	35 ft. 0 in.
(7)	COAL; in Mr. Sam Burton's well, *Jagger seam*	4 ft. 7 in.
(6)	*Slates, Shales, Sandstones*	5 ft. 0 in.
(5)	COAL; forming bottom of Mr. Sam Burton's well. Believed to be about	1 ft. 0 in.
(4)	*Sandstones, Shales*	35 ft. 0 in.
(3)	COAL	1 ft. 0 in.
(2)	*Sandstones*; shaly and slaty	10 ft. 0 in.
(1)	COAL; in Lost Creek	3 ft. to 3 ft. 6 in.

The country along Mill Creek is very broken indeed, and the out-crops of coal are numerous. The head-waters of this creek are some 175 feet below the general level of the country of that part of the county, and have bluffs from fifty to sixty feet in perpendicular heights along their banks. These bluffs are of hard yellowish gray sandstones. The upper of these sandstones are usually more or less massive, while the lower ones are flaggy and slabby. In the flaggy and slabby sandstones, there are numerous *rock-houses*, with the upper massive sandstones as covers. In the N. E. ¼ of N. E. ¼ of S. 27, T. 12, R. 10 W., on the west branch of the North Fork of Mill Creek, there is one of these *rock-houses* which is deserving of special notice on account of its size and structure. It presents *in its back* a remarkable illustration of false bedding, where the large slab and flag rocks lie as regularly as if they had been placed by the hand of man. In the roof or ceiling of this rock-house, the rocks are tied and twisted together in a wonderful manner, though they seem to have a general dip to the south-west. Within the rock-house everything is covered with a light gray coating of copperas and salt-peter. Just in front of this rock-house, and some ten feet lower than its floor, runs a branch, the bed of which, for some four hundred yards, is naked coal. . This seam of coal is reported to be nearly four feet in thickness, though it is believed that the average thickness would be nearer three feet. It crops out in a great many places on the head-waters of Mill Creek, and is a hard and seemingly good coal.

In the N. E. ¼ of S. 24, T. 12, R. 19 W., there is an out-cropping of coal; and also on Mr. Jno. Kelly's land, in the N. W. ¼ of S. 25, T. 12, R. 10 W., there is a coal out-cropping where about twenty-five inches of the coal projects above the water in the branch. On Mr. T. H. Kelly's land in the N. W. ¼ of S. 26, and in the N. W. ¼ of S, 35, T. 10, R. 10 W., a seam of coal forms the bed of a branch for some 150 yards. In Mr. Levi Dodd's well, on the Byler road, near the center of S. 28, T. 12, R. 10 W., there is said to be a seam of coal three feet in thickness, some fifteen feet below the surface. West of the Byler road, in S. 20, T. 12, R. 10 W., on the *Coal Bed branch*, which runs into New River, coal is said to crop out, at intervals, along the branch for nearly a mile. It is said to be about 4 feet in thickness. It is likely (5) of the *General Section*. Farther south, in the neighborhood of Capt. E. D. Kelly's, or *Camp Springs*, in the S. W. ¼ of N. W. ¼ of S. 18, T. 13, R. 10 W., and still farther south, near the Masonic Lodge, there are said to be outcrops of coal which are probably of the seams (5) and (6) of the *General Section*. *Camp Springs* took its name from having been one of the places of encampment for the militia in *ante-bellum* days during *muster times*. The spring rises in a rock house, which is beautified with an evergreen growth of creeping ferns against its moist back ,and is always, during the hot summer days, cool and delightful.

Fresh meat keeps sweet for a considerable length of time, in the warmest weather, when hung up in these open *rock houses*, but, it will not do to confine the meat in any way from the free access of the air, as it will soon mould. In one of these *rock houses*, about ½ mile west of *Camp Springs*, there was run, during the late war, a *wild cat still.* From an other of these *rock houses*, the skeletons of human beings, with cane baskets and the bones of dogs, are said to have been exhumed.

Here near Camp Springs, as in other places, the Byler ridge has been wasted away to the level of the surrounding country or all of the Drift has been washed off of it, but, just a little farther south, at the Masonic Lodge and Dublin P. O., it is a high ridge and is capped with a coating of Drift from 25 feet to 50 feet thick.

On Mr. Geo. W. Bonner's land, in the south-west corner of S. 27, T. 12, R. 10 W., between two and three feet of good coal projects above the water of a branch, for a distance of one-fourth of a mile along the branch. Mr. David, Gilbert has a coal bed, three feet in thickness, in the S. W. corner of S. 34, T. 12, R. 10 .W. In Mr. Dan Mason's well, near the center of S. 3, T. 13, R. 10 W., there is said to be a seam of good coal, twenty-seven inches thick, some fifteen feet below the surface. On Mr. Jno. McGough's land, in S. 2, T. 13, R. 10 W., the coal is three feet in thickness, and on the Walden land, in the N. E. corner of S. 2, T. 13, R. 10 W., the coal is said to be two feet in thickness. All of the above out-croppings of coal on the waters of Mill Creek are believed to be of the same seam, (5) of the *General Section* or (1) of the *Section of Out-Crops near Kansas P. O.* This seam of coal also crops out at Miller's Mill, on Mill Creek, in the S. W. ¼ of S. 6, T. 13, R. 9 W., and on Clifty Creek, in the N. E. ¼ of S. 6, T. 13, R. 9 W., and at other points farther down on Mill Creek. In Mr. J. M. Cagle's well, on the head waters of Clifty Creek, in the N. E. ¼ of S. 32, T. 12, R. 9 W., there is reported to be a seam of coal 5 feet thick, with a hard slate cover and a sandstone underbed. It is likely of this same seam, (5) of the *General Sec-*

tion. At Miller's Mill, on Mill Creek, in the S. W. ¼ of S. 6, T. 13, R. 9 W., its out-crop has about the following section:

Section at Miller's Mill, on Mill Creek,
in the S. W. ¼ of S. 6, T. 13, R, 9 W.

(7)	*Sandstones;* massive, shabby at the bottom, to top of hill, about	25 ft. 0 in.
(6)	*Shale*; sandy and yellowish	4 ft. 0 in.
(5)	COAL; out-crop	3 ft. 0 in.
(4)	*Fire clay*	6 in.
(3)	*Sandstone*; hard and of a yellowish gray color	6 in.
(2)	*Shale;* sandy	6 in.
(1)	*Sandstone;* very hard extending down into the water, showing about	10 in.

Some forty to fifty feet above this seam of coal, there is the seam of the famous *Jagger bed*. This Jagger coal bed is in the N. E. ¼ of S. 11, T. 13, R. 10 W., and has been longer and more universally known and talked of than any other out-cropping of coal in Walker county. In the banks of Jagger Creek, not far from the school house, this out-crop of coal, at the *Jagger bed*, has the following sections:

Section of Jagger Coal Bed,
in the N. E. ¼ of S. 11, T. 13, R. 10 W.

(8)	*Sandstone*; massive, hard, coarse grained and of a yellowish gray color	20 ft. 0 in.
(7)	*Sandstone*; shabby and yellowish	2 ft. 0 in.
(6)	*Shale*; soft and black	4 in.
(5)	*Shale*; sandy and yellowish	4 in.
(4)	COAL; very slaty	1 ft. 11 in.
(3)	COAL; slaty	2 ft. 0 in.
(2)	COAL; good	2 ft. 0 in.
(1)	*Sandstone*; hard, coarse grained, more or less shabby, forming bed of creek	

The following is an other section of this out-cropping of coal; it was taken by the State Geologist and occurs in his report for 1877-1878:

Section of the Jagger's Coal Bed.

(6) Shale
(5) Coal; very bony ....10 in.
(4) Coal; very good, but still somewhat bony .... 6 in.
(3) Coal; good, bright, with thick seams of mineral charcoal. Some pyrites ....2 ft. 8 in.
(2) Bony Coal .... ½ in.
(1) *Sandstone*; forming bed of the branch.

The following analyses are of average samples of this outcropping of coal:

	(1)	(2)
Specific Gravity	1.44	1.233
Sulphur	.36	574
Moisture	2.238	3.091
Volatile Matter	29.037	20.044
Fixed Carbon	50.638	56.537
Ash	17.987	11 328
	100.000	100.000

Along Mill Creek in T. 13, R. 9 W., there are out-crops of coal in S's 8, 17, 18, 20, 21 and 22, most of which are believed to be of the lower seam hereabouts or (5) of the *General Section* or (1) of the *Kansas P. O. Section*, though doubtless some of those farthest down the creek, are of the Jagger seam, (7) of the *General Section* or (7) of the *Kansas P. O. Section.*

In the neighborhood of Mr. T. L. Burton's or Kansas P. O., in S. W. ¼ of S. 19, T. 13, R. 9 W., the out-crops of coal are especially numerous. A general section has already been given of the strata above drainage level in this vicinity, from which we gather that there shows hereabouts five different seams of coal, which range from about one to five feet in thickness. The following is a reported section of Mr. Sam. Burton's well, in the N. E. ¼ of S. 24, T. 13, R. 10 W.:

Section of Mr. Sam. Burton's Well,
in the N. E. ¼ of S. 24, T. 13, R. 10 W.

(7) *Soil, Loose Rock, Shale:* to top of well ....29 ft. 0 in.
(6) Coal; reported to be ....4 ft. 7 in.

(5) *Slate*; argillaceous .... 1 ft. 0 in.
(4) *Shale*; slaty, with thin seams of coal, and many balls of *clay iron stone.* This shale is full of plant impressions. The thin sheets of coal break up into cubes and feather out to nothing........................ 2 ft. 0 in.
(3) *Sandstone*; coarse grain and very hard.......... 1 ft. 0 in.
(2) *Shale*: with *kidney ore* .... 1 ft. 0 in.
(1) COAL; forming bottom of the well, thickness undetermined, thought to be about..................... 1 ft. 0 in.

This coal is doubtless of the same seam as the Jagger's bed, which here seems to be split into two parts that are separated by about five feet of shales and sandstones. As the coal in the bottom of the well was struck, water came into the well so rapidly that the coal was not dug through. It is (7) of the *General Section* and (7) of the *Kansas P. O. Section.* Some forty to fifty feet below this seam in Mr. Sam. Burton's well, there crops out, along a branch, in the E. ½ of N. W. ¼ of S. 24, T. 13, R. 10 W., the following section:

Section in E ½ of N. W. ¼ of S. 24, T. 13, R. 10 W.

(7) *Slate*; clayey and of a yellowish color.
(6) COAL; out-crop .... 1 ft. 0 in.
(5) *Fire clay or clay slate;* about .... 1 ft. 0 in.
(4) *Shale*; yellowish .... 10 ft. 0 in.
(3) *Shale*; black .... 1 ft. 2 in.
(2) COAL .... 3 ft. 6 in.
(1) *Clay*..

About thirty feet above the coal seam in Mr. T. L. Burton's well, which is the same as the one in Mr. Sam. Burton's well or the Jagger seam, there crops out in the S. W. ¼ of N. W. ¼ of S. 24, T. 13, R. 10 W., the following seam of coal:

Out-crop in S. W. ¼ of N. W. ¼ of S. 24, T. 13, R. 10 W.

(4) *Slate*; yellow, forming roof to coal.
(3) COAL; slaty on out-crop........................ 1 ft. 0 in.
(2) COAL; good.................................... 1 ft. 8 in.
(1) *Clayey slate* or *clay*.........................

This is (8) of the *General Section* and (10) of the *Kansas P. O. Section*, and is doubtless of the same seam as the coal on Lost Creek to be hereafter described as the *Baker's lower bed.* In the N. W. ¼ of S. 24, T. 13, R. 10 W., there is an out cropping of coal, covering the bottom of a branch, which is believed to be of this same seam; it is said to be two feet in thickness. Some twenty to twenty-five feet above this last out-cropping of coal, there is, in the N. E. ¼ of S. 24, T. 13, R. 10 W., an other showing of coal, of about ten inches in thickness. This is the uppermost seam in the neighborhood of the Kansas P. O., it is of the same seam as the *Baker's upper bed* or (9) of the *General Section.* South of Kansas P. O., the two lower seams of this neighborhood, or (5) and (6] of the *General Section*, crop out along the bed and banks of Lost Creek for a mile or two, as in the following section which was given by the State Geologist in his report for 1879–1880 :

Out-crop on Lost Creek,
in the S. E. ¼ of S. E. ¼ of S. 30, T. 13, R. 9 W.

(6)	*Sandstone;* slaty	
(5)	*Slate;* black	1 in.
(4)	COAL.	1 ft. 0 in.
(3)	*Clay slate*	2 ft. 0 in.
(2)	*Sandstone;* slaty	10 ft. 0 in.
(1)	COAL; in bed of Lost Creek, reported	3 ft. 0 in.

The coal (1) of the above section has the reputation of being a fine shop coal, which seems to be well deserved from the following analysis of specimens of it:

Specific gravity	1.315
Sulphur	.586
Moisture	2.606
Volatile matter	34.110
Fixed carbon	56.628
Ash	6.656
	100.000

In the S. E. ¼ of S. E. ¼ of S. 33, T. 13, R. 9 W., there is an outcrop of coal on *Myer's branch*, two feet in thickness.

This coal is likely (8) of the *General Section*. In Lost Creek, in the N. E. ¼ of N. E. ¼ of S. 34, T. 13, R. 9 W., about one-fourth of a mile east of Guttery's Mill, there shows a three inch seam of good hard coal which is covered by about four inches of slate and then by huge loose boulders of sandstone. This thin seam of coal also crops out in Cheatham's creek, in the N. E. corner of S. 26 and S. E. corner of S. 23, T. 13, R. 9 W. In this last locality, the following section occurs :

Section on Cheatham Creek, in S. 23, T. 13, R. 9 W.

(5) *Sandstone ;* massive and slabby, forming high bluffs with *rock-houses*..60 ft. 0 in.
(4) COAL; in *rock-house*, visible.. ....8 in.
(3) *Debris* ....15 ft. 0 in.
(2) COAL; just under water..............................4 in.
(1) *Slate;* under water. ....

In these rock-houses, there are many beautiful ferns. We believe these two thin out-croppings of coal to be of the seams below the Jagger seam. Some two miles farther up Cheatham's Creek, on Wiley Johnson's land, in S. 12, T. 13, R. 9 W., there is said to be an out-cropping of coal.

Near Mr. R. Keeton's, in the N. E. ¼ and S. E. ¼ of S. 11, T. 14, R. 9 W., there are the out-crops of three seams of coal, about as follows :

Section near Mr. R. Keeton's, in S. 11, T. 14, R. 9 W.

(6) *Soil, Shale*; to top of Mr. Keeton's well ... ...13 ft. 0 in.
(5) COAL; in well and on side of hill...... ....10 in.
(4) *Debris, Shale*.............................. ....20 ft. 0 in.
(3) COAL; shaly towards top, on branch.... ......2 ft. 3 in.
(2) *Debris, Shale*....... . ...20 ft. 0 in.
(1) COAL; in deep holes in Lost Creek, for a mile or so, has been dug down into more than a foot.

These seams are respectively (9), (8) and (7) of the *General Section*, or seams of the *Baker's upper and lower beds* and of the *Jagger's bed*. On *Jim Branch*, in the S. E. ¼ of S. 10, T. 14, R. 9 W., the following section crops out:

Section on Jim Branch, in S. E. ¼ of S. 10, T. 14, R. 9 W.

(4) *Shales, Sandstones;* the sandstones are in a few thin seams in the shale.......... .... 20 ft 0 in.
(3) COAL; very hard and good....... . ...8 in.
(2) *Slate*; of a bluish color...... . ... 6 in.
(1) *Sandstones;* forming bed of branch.

A hundred yards or so down the branch from the place of this section or some seventy-five yards from the mouth of the branch, there is a deep hole in the branch which is known as the "*Jim Hole.*" In the banks of the branch just below the "*Jim Hole,*" or in the S. W. ¼ of S. 11, T. 14, R. 9 W., the following out-crop can be seen:

Out-Crop at "Jim Hole," in the S. W. ¼ of S. 11, T. 14, R. 9 W.

(3) *Shales, Sandstones, Debris.*
(2) COAL; the upper ten inches are slaty....... .2 ft. 4 in.
(1) *Slate;* bluish, seen ....3 ft. 0 in.

This coal is waving and is (8) of the *General Section* or is of the same seam as the *Baker's lower bed.*

Coal is said to crop out along the West Fork of Lost Creek, at intervals, from the mouth of Jim Branch to far below Mr. R. Keeton's. There was dug through in a well, in the S. W. ¼ of S. 14, T. 14, R. 9 W., some eighteen feet below the surface, a soft, coarse grain micaceous sandstone, of a dark gray color, which is full of the impressions of fossil coal plants. The flagstones, in many of the beds hereabouts, are of great regularity and perfectly beautiful; they are used only for covering graves, and for head and foot stones to the same. They are from an inch to eighteen inches in thickness and occur in seams, from three to seven feet in thickness, in the hard shales. There crops out, in several places, on the sides of the hills, along the Jasper and Pikeville road, about one-half of a mile north of Holly Grove, two seams of coal, about as in the following section:

Section along Pikeville Road one-half Mile North of Holly Grove.

(5)	*Debris, Shale;* to top of hill	15 ft. 0 in.
(4)	COAL; out-crop from	8 in. to 1 ft. 2 in.
(3)	*Shale, Debris*	12 ft. 0 in.
(2)	COAL; out-crop from	1 ft. 4 in. to 1 ft. 6 in.
(1)	*Shale, Debris;* to bottom of hill	15 ft. 0 in.

These coal out-crops show very imperfectly; they are believed to be of (9) and (8) of the *General Section* or of the same seams as the *Baker's upper* and *lower beds.* In a ravine, north of Holly Grove, about two hundred yards, a seam of coal is said to make its appearance and also in Dr. Miller's well, at Holly Grove, they are doubtless of the same seam. It is reported to be three feet in thickness in the well. It is likely of the lower seam of the section above.

In the road, about two miles west of Holly Grove, there is an out-cropping of coal, near the top of a very high ridge. This coal out-cropping must be one hundred feet or more above Lost Creek. As the road descends to the ford of Lost Creek, near the center of S. 7, T. 14, R. 8 W., there occurs the following out-crop:

Out-Crop at the Ford of Lost Creek, near the center of S. 7, T. 14, R. 8 W.

(5)	*Shales, Debris*, to second bottom	10 ft. 0 in.
(4)	COAL; visible, about	1 ft. 0 in.
(3)	*Clay*	1 ft. 0 in.
(2)	*Shale;* sandy	3 ft. 0 in.
(1)	*Sandstones, Shales;* the sandstones are in ledges, from four to five feet thick, with three feet of shale between them. About	25 ft. 0 in.

About two hundred yards a little east of south from *Bethel Church*, at Holly Grove, there crops out, in the banks of a small branch, a seam of coal with the following section:

Section naar Bethel Church at Holly Grove.

(4)	*Shales, Sandstones, Debris*; on side of hill. The sandstone is in seams in the shale	15 ft 0 in.
(3)	*Shale*; yellowish, forming bank of creek	4 ft. 0 in.
(2)	COAL; slaty, out-crop	1 ft. 0 in.
	COAL; good, out-crop	8 in.
(1)	*Fire Clay.*	

The coals of these two last sections are believed to be respectively of the seams (8) and (9) of the *General Section*, or of the same seams as Baker's lower and upper beds.

In the banks of Lost Creek, in the south-east corner of S. 7, T. 14, R. 8 W., there occurs the following section:

Section on Lost Creek, in the South-east corner of S. 7, T. 14, R. 8 W.

(8)	*Sandstones*; a little shaly and slabby, especially towards the bottom, forming a bluff about	30 ft. 0 in.
(7)	*Shales*; hard and sandy	1 ft. 6 in
(6)	COAL; the upper ten inches is shaly, in outcrop	2 ft. 3 in.
(5)	*Shale, Debris*	10 ft. 0 in.
(4)	COAL; may be of a slide, showing	1 ft 6 in.
(3)	*Slate, Debris*	4 ft. 0 in.
(2)	COAL; showing from	10 in. to 1 ft 0 in.
(1)	*Slate;* bluish to level of water	3 ft. 0 in.

Coals (2) and (4) of the above section are parts of the same seam, which is (7) of the *General Section* or of the same seam as the *coals* in Messrs. T. L. Burton's and Sam Burton's wells, or of the same seam as the Jagger's bed. Coal (6) of this last section is doubtless of the same seam as the *Baker's lower bed*, (8) of the *General Section*. The seam of the coal out-crop near Bethel Church or of the *Baker's upper bed* is likely some ten feet above (8) or the bluff of this last section. In the N. W. ¼ of S. W. ¼ of S. 8, T. 14, R. 8 W., some twenty feet below the surface, in John McGuttery's well, there is said to be a seam of coal 4 ft. thick. It is believed to be of the same seam as (6) of the last section. Near the middle of the east side of S. 18, T. 14, R. 8 W., there is an out-cropping of coal which measures, on the outcrop, nine inches in thickness: it has a clay underbed and is of the same seam as the out-cropping near Bethel Church or the *Baker's upper bed* or (9) of the *General Section.* Some three-fourths of a mile still farther down Lost Creek, or in the N. E. ¼ of N. E. ¼ of S. 18, T. 14, R. 8 W., the following section occurs:

Section on Lost Creek, in the N. E. ¼ of N. E. ¼ of S. 18, T. 14, *R.* 8 *W.*

(6)	*Sandstones;* slabby to top of bluff	10 ft. 0 in.
(5)	COAL; out-crop	1 ft. 0 in.
(4)	*Fire Clay*	1 ft. 0 in.
(3)	*Sandstones, Shales*	35 ft. 0 in.
(2)	COAL	2 ft. 3 in.
(1)	*Slate;* to level of water	3 ft. 0 in.

These coals, (2) and (5), are of the two upper seams which we have been considering along Lost Creek all the way down from Kansas P. O. They are (9) and (8) of the *General Section* or are of the same seams as the *Baker's upper and lower beds.* At the locality of this last section, the *coals* (4) and (2) of the section in the S. E. corner of S. 7, T. 14, R. 2 W., or of the *Jagger's seam,* have disappeared beneath the water. Some 150 yards still farther down Lost Creek, from the locality of this last section, the coal (2) of that section, is some six feet above the level of the water, and still farther down the creek, near the half-mile line of S. 18, T. 14, R. 8 W., it passes below the level of the water to again make its appearance above the water some two hundred yards still farther yet down the creek, or in the S. W. ¼ of the S. W. ¼ of S. 18, T. 14, R. 8 W., where it measures two feet one inch in thickness. This coal seam is, therefore, here along Lost Creek, in long flat waves. It also crops out on a branch, in the S. E. ¼ of S. E. ¼ of S. 13, T. 14, R. 9 W., not far from the last out-crop mentioned.

On Lost Creek, in the N. W. ¼ of N. W. ¼ of S. 19, T. 14, R. 8 W., we find the following section:

Section on Lost Creek, in the N. W. ¼ of the N. W. ¼ of S. 19. T. 14, R. 8 W.

(4)	*Sandstones;* slabby to top of bluff	20 ft. 0 in.
(3)	COAL	10 in.
(2)	*Fire Clay*	1 ft. 6 in.
(1)	*Slate;* with perhaps some seams of sandstone, to water level	10 ft. 0 in.

This coal (3) is (9) of the *General Section*, or is of the same seam as the out-crop near Bethel Church or is the same as the *Bakers's upper bed.* The coals of the two lower seams, or of the *Jagger's bed* and *Baker's lower beds*, are therefore here both below the bed of Lost Creek. This same seam of coal, (9) of the *General Section*, also crops out in Hurricane Creek, which empties into Lost Creek just above where the last section occurs; it also shows in Jno. King's well, in the E. ½ of N. E. ¼ of S. 18, T. 14, R. 8 W. In all of the deep holes of Lost Creek, from the place of the last section to the mouth of Burton's Creek, there is said to be coal, which is some twenty feet below the coal of the last section and hence must be of the same seam as *Baker's lower bed.*

In its out-cropping at what is known as *Guttery's Cave Hole*, there is the following reported section by the State Geologist:

Out-Cropping in Guttery's Cave Hole, in the N. E. ¼ S. 18, T. T. 14, R. 8 W.

(4)	*Sandstone;* ledge	
(3)	*Slate;* the lower part is clayey and fossiliferous and has nodules of *clay iron stone*	1 ft. 0 in.
(2)	COAL; rather bony	3 in.
	COAL; harder and brighter	2 ft. 1 in.
(1)	*Slate.*	

An average sample of the coal from this out-cropping gave the following analysis:

Specific Gravity	1.365
Sulphur	.687

Moisture	3.332
Volatile Matter	30.683
Fixed Carbon	52.762
Ash	13.223
	100 000

On Lost Creek, in the N. E. ¼ of S. 16, T. 14, R. 8 W., just below the *Swift ford*, which is about ½ mile below the mouth of Burton's Creek, there occurs the out-cropping of coal which is known as the *Baker's lower bed* and to which references have so frequently been made.

Section near the Swift Ford on Lost Creek,
in the N. E. ¼ of S. 16, T. 14, R. 8 W.

(5)	*Debris*	15 ft. 0 in.
(4)	*Slate*; hard	3 ft. 0 in.
(3)	COAL; out-crop	2 ft. 0 in.
(2)	*Slate*	3 ft. 0 in.
(1)	Sandstone; shabby, to level of water	4 ft. 0 in.

The coal in this out-crop does not show its full or average thickness, which is about two feet six inches. About 150 yards down Lost Creek, from where the above section occurs, the coal (3) disappears below the water level. It was from this out-crop in the bed of Lost Creek, that boat loads of coal were raised and floated down to Mobile. The State Geologist in his report for the year 1879-80 gives, on page 50, a section of the *Baker beds* at this locality, as follows:

Section of Baker Beds on Lost Creek,
below the Mouth of Burton's Creek.

(6)	*Clay Slate*; roof	1 ft. 3 in.
(5)	COAL; bony on top, good below, *Baker's upper bed.*	1 ft. 8 in.
(4)	*Fire Clay*	2 in.
(3)	*Gritty State*	2 ft. 0 in.
(2)	*Sandstones*; slaty, in hard ledges	7 ft. 0 in.
(1)	COAL; good, hard, in bed of creek, *Baker's lower bed*, reported to be	3 ft. 0 in.

The following analyses are of specimens of the lower of these coal out-crops, (1) of the above section, and of an average sample of the upper coal out-crop, (5) of the above section:

	(1)	(2)
Specific Gravity	1.321	1.285
Sulphur	.695	1.331
Moisture	6.355	2.578
Volatile Matter	31.086	35.164
Fixed Carbon	60.665	59.348
Ash	1.894	2.910
	100.000	100.000

No. 1, sample from *Baker's upper bed.*
No. 2, specimens from *Baker's lower bed.*

These analyses, though made of very badly weathered specimens, show the coals of both beds to be of an excellent quality.

There is reported to be in Mr. J. J. Thomas' well, in the S. E. ¼ of S. 16, T. 14, R. 8 W., twelve feet below the surface, a seam of coal 18 inches thick, and then, seven feet of slate to an other coal seam in the bottom of the well. These *coals* may be of the same seam as the Jagger bed. In the banks of a branch, in the N. E. ¼ of S. 21, T. 14, R. 8 W., near the *Steedman Ford* on Lost Creek, there is an other out-cropping of coal which measures about sixteen inches in thickness. Mr. J. J. Thomas is said to have a coal bed, on the side of a high ridge south of Horse Creek or in the S. E. ¼ of S. 21, T. 14, R. 8 W. The *Jas Rutledge's coal bed* is in S. 34, T. 14, R. 8 W.; it shows, so said, for some distance along Cooner's Creek, near the mouth.

On Lost Creek, in the S. E. ¼ of S. 2', T. 14, R. 8 W., some three miles below the *Baker's beds* of the last section, there is the following out-cropping of good coal, which is known as the *Robinson bed.*

Section at Robinson Coal Bed, on Lost Creek, in the S. E. ¼ of S. 21, T. 14, R. 8 W.

(5) DRIFT; an arenaceous, shaly looking mass, full of rounded pebbles	10 ft. 0 in.
(4) *Slate;* yellowish and bluish in color	1 ft. 8 in
(3) COAL; upper six inches are a little slaty	2 ft 9 in.
(2) *Shale, Debris*; the shale contains seams, about two inches thick and three feet apart, of a sandy *iron stone*, and also thin seams of shaly sandstone	20 ft. 0 in.
(1) *Sandstone;* flaggy, a little shaly in places, to level of water about	5 ft. 0 in.

The coal out-cropping, (4) of this section, would appear to be, from the dip of the strata hereabouts, some 40 to 50 feet above the seam of the *Baker's lower bed*, though in reality it is the same seam. It is a hard, good coal. It is in long waves and at this out-crop has a decided dip to the south-west. The *clay iron stone* in thin seams in the shale just below this coal, or in (2) of the above section, has the following analysis:

Specific Gravity	3.303
Silica	15.215
Carbonate of Protoxide of Iron	54.352
" " " " Manganese	.837
" " Lime	2.647
Peroxide of Iron	6.951
Alumina	8.592
Phosphoric Acid	1.422
Undetermined and Loss	9.984
	100.000

The coal (8) of the *General Section*, or the coal seam which contains the *Baker's lower bed*, in its out-crop at the mouth of Burton's Creek is some twenty feet above low water level in Lost Creek. This same coal seam also crops out in what is known as the *Steedman coal bed*, in Mr. J. J. Steedman's field, in the N. E. ¼ of S. 15, T. 14, R. 8 W.

Section of Steedman Coal Bed, in the N. E ¼ of S. 15, T. 14, R. 8 W.

(4)	*Slate.*	10 ft. 0 in.
(3)	COAL; the top ten inches shaly.	2 ft. 4 in.
(2)	*Debris.*	4 ft. 0 in.
(1)	*Sandstones;* slabby, forming bed of branch.	

It also makes its appearance on Burton's Creek, about one-half of a mile from the mouth, and in the south-east corner of S. 9, T. 14, R. 8 W.

Section along the Jasper and Holly Grove Road, near the Center of S. 8, T. 14, R 8 W.

(6:	*Shale,·Debris;* to top of hill		25 ft. 0 fn.
(5)	COAL; Baker's *upper bed*, approximated		1 ft. 6 in.
(4)	*Shale, Debris;* with *clay iron stone*		20 ft. 0 in.
(3)	COAL	Baker's lower bed.	2 ft. 0 in.
	Clay		2 ft. 0 in.
	Slate; gritty with *clay iron stone.*		3 ft. 0 in.
	COAL		6 in.
(2)	*Slate;* siliceous, curly		2 ft. 6 in.
(1)	*Sandstone;* slabby, forms bed of Poll's Creek.		

Coal (3) of this section is (8) of the *General Section* or of the same seam as *Baker's lower bed.* One-fourth and three-fourths of a mile higher up Poll's Creek, and south about one-fourth of a mile, there are said to be out-crops of coal. Coal also makes its appearance in Mr. M. M. Boshell's spring, in the S. W. ¼ of S. 9, T. 14, R. 8 W., and about one-fourth of a mile west of Mr. Boshell's. All of these out-croppings are about eighteen inches in thickness and are very likely of the same seam as *Baker's upper bed.*

On the head waters of Burton's Creek, in the southern part of S. 34. T. 13, R. 8 W., there are the well known thick out-croppings of coal which are called the *Townley Coal Bed.* These out-crops are only second in fame to the *Jagger's bed* and are of the same seam as that noted coal out-crop. They are several in number and are within a radiusof less than one-half of a mile. The coal in these out-croppings is very variable as to thickness and quality; that above the slate parting and even the slate parting itself, often changes very much within a few feet. The seam in these out-crops appears to be waving from north-east to south-west. The following partial section is of the most easterly of these out-croppings that was seen:

Section of Townley Coal Bed,
in S. 34, T. 13 R. 8 W.

(4)	COAL; very slaty, top	2 ft. 0 in.
(3)	COAL; bony and slaty, but better than (4)	2 ft. 0 in.
(2)	*Slate*	11 in.
(1)	COAL; good, said to have been gone into, without getting through it	2 ft. 0 in.

The State Geologist in his report for 1879-1880, gives the following as a section of one of these coal out-crops:

(6)	*Sandstones*; slaty			10 ft. 0 in.
(5)	*Slate*; bluish, with many fossils			2 ft. 0 in.
(4)	*Shale*; soft parting			1 in.
(3)	COAL; bony	2 in.	Upper Bench.	3 ft. 6 ½ in.
	COAL; good, but somewhat bony	1 ft. 4 in.		
	Mother of COAL; parting	½ in.		
	COAL; good, best at bottom	2 ft. 2 in.		
(2)	*Slate*; hard and black, fossiliferous			11 in
(1)	COAL; best in the bed	2 ft. 0 in.	Lower Bench.	4 ft. 0 in.
	Slate; black, fossiliferous	2 ft 0 in.		

The following analyses are of average samples of the coal of one of these out-croppings:

	(1)	(2)
Specific Gravity	1.310	1.450
Sulphur	.710	1.744
Moisture	3.007	2.960
Volatile Matter	29.084	26.162
Fixed Carbon	63.352	44.516
Ash	4.557	26.362
	100.000	100.000

No. 1, is of the coal from *below slate parting*.
No. 2, is of the coal *above the slate parting*.

About one-fourth of a mile a little south of west and one-half of a mile north-west, from the out-cropping of the first of the above sections, there are other out-croppings of this same seam of coal. About one mile to the south-east, over the divide between the waters of Burton's Creek and Big Cane or Coal Creek, this coal again makes its appearance; this time in the S. W. ¼ of S. 2, T. 14, R. 8 W., in what is known as the *Kitchen's* (*Jessie*) *coal bed.* This out-crop had been dug into but, at the time visited, the pit had water in it which partly covered the coal.

Section of Jessie Kitchen's Coal Bed,
in the S. W. ¼ of S. 2, T. 14, R. 8 W.

(6)	*Shale;* clayey and of a yellowish color, showing about	10 ft. 0 in.
(5)	Coal; slaty	3 ft. 7 in.
(4)	*Slate*	½ in.
(3)	Coal	1 ft. 0 in.
(2)	*Slate*	8 in.
(1)	Coal; under water, doubtless contains partings of slate. Measured with a stick	3 ft. 6 in. to 4 ft. 0 in.

This seam of coal is also said to show itself on the side of a hill about one-half of a mile a little east of north of the above *Kitchen's coal bed.* North-east of the *Kitchen's coal bed*, on the head waters of Big Cane Creek, in T. 18, R. 8 W., S's. 35, 36, and 25, and in the wells throughout that neighborhood, there are outcrops, of about fifteen inches in thickness, of a good, hard coal. These out-crops are believed to be of the coal (6) of the *General Section*, or of a seam some forty or more feet below that of the *Townley bed.* They are also thought to be of the same seam as the out-cropping of coal in the edge of the town of Jasper. Near the steam mill on Town Creek, in the south-western edge of Jasper, there is an out-cropping of coal of about fifteen inches in thickness, with a cover of hard slate and seemingly an underbed of slabby sandstones. Along Tan Yard Creek, in the eastern edge of Jasper, there are plainly to be seen false beddings in the rocks. These falsely bedded rocks form a seam about three feet in thickness, and are made up principally of flagstones, which have a dip of some 30° to the S. W., while the massive sandstones, above and below, have a dip of only about 8° to the S. W. From the bed of this creek, in several places in the edge of Jasper, there boil up springs that never go dry and that are more or less impregnated with sulphuretted hydrogen gas. South of Jasper, better than a mile, there crops out, in the Tuscaloosa road, a thin seam of *clay iron stone*, in the hard curled clayey slates. From just above this seam of ore, there rises several springs whose waters are believed to come from a covered out-cropping of coal. Some of these springs also taste and smell of the above sulphur gas. Further south, down this road, there crops out the following section:

Section of Outcrops in Tuscaloosa Road, about two Miles south of Jasper.

(4) *Slate, Debris ;* over the coal.
(3) COAL; visible, about........................ 2 ft. 0 in.
(2) *Debris*; covering clay or clayey slate.......... 5 ft. 0 in.
(1) CLAY IRON STONE; thin.

Where this road crosses Big Cane Creek, we find the following out-crops:

Section of out-crops along Tuscaloosa and Jasper Road, at the Crossing of Big Cane Creek.

(5) *Loam, Debris ;* to top of hill.
(4) COAL; out-crop ....1 ft. 8 in.
(3) *Clay.*
(2) *Slates, Sandstones, Debris;* principally hard shales with seams of sandstones, and covered in places by debris. About .... 100 ft. 0 in.
(1) *Sandstone ;* slabby, forming bed of creek.

This coal is believed to be of the same seam as the *Baker's upper bed.* On *Doctor's* Creek and in the wells in S. 25, T. 14, R. 8 W., there are said to be out-crops of coal.

At the crossing of Big Cane Creek by the lower Tuscaloosa road, in the N. E. ¼ of S. 29, T. 14, R. 7 W., there is a bluff, some fifteen feet high, of hard sandy shales, with seams of flaggy sandstones. In this bluff are some *false* *beddings* of the rocks and places where the massive shale is curled into knots. The thin concentric sheets, or scales, which form these knots, peal off as in the case of an onion. At *C. C. Stock's coal bed,* on a branch in the N. E. ¼ of S. 6, T. 15, R. 7 W., we get the following section:

Section at C. C. Stock's Coal Bed, in the N. E. ¼ of S. 6, T. 15, R. 7 W.

(7)	*Debris;* loose massive sandstones, shales, etc.	175 ft. 0 in.
(6)	*Sandstone;* slaty, forming a bluff	15 ft. 0 in.
(5)	*Slate;* of a yellowish color	8 ft. 0 in.
(4)	COAL	2 ft. 8 in.
(3)	*Slate;* visible	1 in.
(2)	*Debris*	8 ft. 0 in.
(1)	*Sandstones;* slabby and of a yellowish gray color.	

This coal is believed to be (8) of the *General Section,* or of the same seam as the *Baker's lower bed* on Lost Creek. The rocks at this out-cropping dip to the north, which dip must be of a wave, since the general dip is in the opposite direction. The dip is about 6° to N. This same seam of coal is said to also show on the widow Bettie Jackson's land in the S. E. ¼ of S. 6, T. 15, R. 7 W., and also in widow Margaret Kilgore's field. At Mr. R. B. Blackwood's Spring, in the N. E. corner of S. 12, T. 15, R. 8 W., there occurs the following out-cropping:

Out-cropping at Mr. R. B. Blackwood's Spring, in the N. E. corner of S. 12, T. 15, R. 8 W.

(5)	*Sandstones;* massive, loose.	
(4)	*Debris;* soil and sandstones; the sandstones are shaly and micaceous, and contain *curls* or *knots* that are composed of concentric scales or envelopes that easily peal off; they also have some *iron stone*	10 ft. 0 in.
(3)	BASTARD LIMESTONE; a very hard and compact fossiliferous rock, with a conchoidal fracture, of a dark gray or black color; it is of uniform composition and occurs in a regular seam	1 ft. 0 in.
(2)	*Sand;* of a dark bluish color, believed to be from the weathering of (3) and (1)	6 in.

(1) BASTARD LIMESTONE; like (3) above; it weathers into a shaly rock.... ... .1 ft. 0 in.

Specimens from (1) and (3) of the above section gave on analysis, the following results:

Specific gravity	2.684
Silica	60.399
Carbonate of Lime	25.553
" " Magnesia	.652
Peroxide of Iron	4.345
Alumina	3.057
Undetermined and loss	5.994
	100.000

Around the above spring, there is said to have been found several Indian hatchets, or scrapers, which are seemingly of similar rocks to (1) and (3) of the above section.

In sections 27, 28, 29, 32 and 33, T. 14, R. 7 W., there are numerous coal out-crops which doubtless belong to the seams from (7) to (9), inclusive, of the *General Section.* In the S. W. ¼ of N. E. ¼ of S. 32, T. 14, R. 7 W., there is an out-cropping of coal, which is called the *Jackson coal bed,* that is said to be two feet nine inches thick. An out-cropping of coal, similar to the *Jackson bed,* is said to be in the S. E. ¼ of S. E. ¼ of S. 29, T. 14, R. 7 W., where there occurs, some twenty-five feet above it, the out-cropping of a second seam, and in the next *forty* acres, and seemingly below the Jackson coal bed, there is an outcropping of what appears to be a third and thicker seam. In the same *forty* as the *Jackson bed,* and a *forty* adjoining, there are two out-crops which show from nine to thirteen inches of coal that have a yellowish clayey shale covering and a bluish slate underbed. Coal is also said to show in the N. W. ¼ of S. 19, about twelve inches thick; in the N. E. ¼ of S. 20, about six inches thick, and in S. 30 about twelve inches thick, all of which out-crops are believed to be of the same seam as the two out-crops mentioned just above. In the N. E. ¼ of N. W. ¼ of S. 33, T. 14, R. 7 W., there is the out-cropping of coal which is called the *Stephenson coal bed,* as follows:

Section at the Stephenson Coal Bed, in the N. E. ¼ of N. W. ¼ of S. 33, T. 14, R. 7 W.

(5)	*Debris;* covering side of hill.	
(4)	*Slate;* clayey of a yellowish color, showing	15 ft 0 in.
(3)	COAL; good	2 ft. 6 in.
	COAL, *very slaty,* on out-crop	8 in.
(2)	*Slate;* bluish	15 ft. 0 in.
(1)	*Sandstones*; shabby and of a mouse color, form cascades in a branch, showing	5 ft. 0 in.

This coal is doubtless (8) of the *General Section* or of the same seam as the *Baker's lower bed.* On the side of a hill, in the S. E. ¼ of S. 28, T. 14, R. 7 W., there is an out-cropping of coal with about the following section:

Section in the S. E. ¼ of S. 28, T. 14, R. 7 W.

(5)	*Shale, Debris*; to top of hill	35 ft. 0 in.
(4)	COAL; out-crop about.	4 ft. 0 in.
(3)	*Clay*	2 ft. 0 in.
(2)	*Shale*	3 ft. 0 in.
(1)	*Sandstones;* to bed of branch	9 ft. 0 in.

The seam of this out-cropping of coal occurs in Mr. J. M. Kitchen's well, in the S. W. ¼ of S. W. ¼ of S. 27, T. 14, R. 7 W., where it is said to be 3 feet 6 inches thick and is covered by a blue slate with nine feet of sandstone. This coal is, though thicker, likely of the same seam as that in the *Stephenson bed.* Coal is said to appear in the bed of the branch some fifteen feet below the above out-cropping and, hence, if the above out-crop is of the same seam as the Baker's lower bed, that in the branch must be of the thick or Jagger's seam. Still lower, some 50 to 60 feet, there is said to be in Big Cane Creek, in the N. W. ¼ of S. 27, T. 14, R. 7 W., an out-cropping of coal 8 inches thick.

There crops out in the old Jonesboro road, just south of *Hewitt P. O.*, the following seam of coal:

Section of Out-Crop in Jonesboro Road, neur Hewitt P. O., in S. 3, T. 15, R. 7 W.

(4)	*Shale;* over coal, showing	10 ft. 0 in.
(3)	COAL; out-crop	6 in.
(2)	*Clay*; very thin.	
(1)	Shale.	

About one-half a mile north of Mr. J. A. Jones, who lives in the N. E. corner of S. W. ¼ of S. 2, T. 15, R. 7 W., there is said to be a seam of coal in a well three feet thick. Coal also occurs N. E. of Mr. Jones about one-fourth of a mile and east one-half of a mile.

In the Jonesboro road, on the side of a hill, in the N. E. ¼ of S. E. ¼ of S. 1, T. 15, R. 7 W., there is the out-cropping of a seam of coal about two feet in thickness with a covering of yellow sandy shale. This coal, at the out-crop, seems to dip towards the north-west. A little farther down the road, in the N. E. ¼ of S. 2, T. 15, R. 7 W., in the banks of *Bull Barren Creek*, there crops out the following section :

Section on Bull Barren Creek, tn the S. E. ¼ of S. 2, T. 15, R. 7 W.

(8)	*Debris.*	
(7)	*Sandstones*; slabby	5 ft. 0 in.
(6)	*Shale*	8 ft. 0 in.
(5)	*Sandstones;* shabby, dove colored	6 ft. 0 in.
(4)	*Slates*; yellowish	8 ft. 0 in.
(3)	COAL; said to be from	2 ft. 2 in. to 2. ft. 4 in.

This last out-crop of coal is a good deal lower and somewhat thicker than the preceding out-crop in the road; they are believed to be of (9) and (8) of the *General Section*, and of the same coals as *Baker's upper* and *lower beds*. At this last out-cropping on Bull Barren Creek, the rocks seem to dip to the S. E. and hence they are in waves. From this out-crop on Bull Barren Creek, boat loads of coal have been raised. The coal was hauled in wagons, one-fourth of a mile, to Big Cane Creek, and dumped into flat boats and floated to Mobile.

At *Texas Spring*, in the N. W. ¼ of N. E. ¼ of S. 14, T. 15, R. 7 W., there is to be seen eight inches of good coal with a yellow slate cover and a blue slate underbed. There is said to be an out-cropping of coal on *Spoke Odge Creek*, in the S. W. ¼ of S. 30, T. 14, R. 6 W.

On a branch in the N. E. ¼ of S. 7, T. 15, R. 6 W., there is an out-cropping of coal, from 3 ft. 1 in. to 3 ft. 3 ins. in thickness, without any partings and with a yellow slate cover and a clayey slate underbed. This is a very hard coal of bright and dull streaks, and is thought to be (8) of the *General Section* or of the same seam as the *Baker's lower bed.* At Mrs. E. M. Russell's spring on *Frog Ague Creek*, in the N W. ¼ of S. 27, T. 15, R. 6 W., in a rock house, there is an out-cropping of coal, 2 ft. 1 in. thick, without any partings. It has an underbed of slate and a cover of hard shales which contains seams of sandstone and form a bluff. Though much thinner and considerably lower, this coal is thought to be of the same seam as the last outcropping or of the *Baker's lower bed.* This out-crop is about ten feet above the water level in Frog Ague Creek, but, about one-fourth of a mile farther up the creek, it crops out in the bed of creek. Some forty feet above this coal in the bed of the creek, there is an outcropping of coal in the road, of about twelve inches thickness, with an underbed of clay. The seam of this last coal is doubtless identical with that of the *Baker's upper bed.*

On Frog Ague Creek, in S. 8, T. 15, R. 6 W., we find the following out-cropping of coal:

Out-Cropping on Frog Ague Creek, in S. 8, T. 15, R. 6 W.

(10) *Sandstone*; massive.

(9) *Shale;* heavy and of a yellowish color, it forms a bluff.......... ....10 ft. 0 in.

(8) *Shale;* full of impressions of coal plants............2 in.

(7) Coal; soft and *very shaly*, a dull lignitic looking coal with an occasional hard and bright thin streak of coal.....11 in.

(6) Coal; *very slaty*, of a dull color, very much like lignite in appearance.......... ....2 in.

(5) COAL; same as (7) above ....7 in.
(4) COAL; dull and shaly with some bright streaks of coal.6 in.
(3) *Slate*. ....½ in.
(2) COAL; same as (4).............................4½ in.
(1) *Slate;* may be merely a parting.

This coal out-cropping is believed to be of (8) of the *General Section* or of the same seam as the Baker's lower bed. Several specimens of coal that was taken from this out-cropping, gave on analysis the following results:

Specific Gravity	1.451
Moisture, at 110°C	2.708
Volatile Matter	25.360
Fixed Carbon	53.622
Ash	18.310
	100.000

The coal of the above analysis was a laminated bony coal of bright and dull bands, that was much weathered. It coked poorly and left a gray ash. Not far from the above out-cropping of coal, there boils up from the bed of Frog Ague Creek, a *sulphur spring* of cool and palatable water, and just below the spring, there is, in the bed of the creek, a very perceptible wave in the rocks.

Near Mt. Carmel Church, in the N. E. ¼ of S. 8, T. 15, R. 6 W., there is an out-cropping of coal which is known as the *Mt. Carmel Coal Bed.* It has the following section:

Section at Mt. Carmel Coal Bed,
in the N. E ¼ of S. 8, T. 15, R. 6 W.

(7) *Shale;* clayey, fossiliferous, and of an orange color..15 ft. 0 in.
(6) COAL; good, but a little bony on top ....2 ft. 7 in.
(5) *Slate* ....½ in.
(4) COAL; good and hard, a little bony.. ....5 in.
Upper bench
(3) *Slate*; parting....................................5 in.
(2) COAL; good and hard. *Lower bench*............2 ft. 2 in.
(1) *Slate;* fossiliferous, black.

This coal is (7) of the *General Section* or is of the same seam as the Jagger bed, Townley bed, etc. The coal is laminated and contains, between the layers, thin sheets of mineral charcoal. The yellow clayey slate cover is very much knotted and curled. At this out-cropping, the rocks appear to have a dip to the N. W, but, just to the west of it, the measures seem to have been disturbed, and the coal to have had a down-throw. This out-cropping of coal is near Frog Ague Creek and much coal has been raised from it and floated down the river to Mobile and other markets. This coal is hard and bright, and is well suited for stocking. The following analyses show separately the character of the coals of the *upper* and *lower benches* or of the coals above and below the slate parting (3) of the above section:

	(1)	(2)	(3)
Specific Gravity	1.380	1.352	1.368
Sulphur	.586	.458	.566
Moisture	2.213	1.689	1.782
Volatile Matter	28.987	28.503	25.873
Fixed Carbon	56.454	54.628	57.509
Ash	12.355	15.180	14.836
	100.000	100.000	100.000

Nos. (*1*) *and* (*2*) are of average samples of the coal above the slate parting. It is a hard, firm coal of brighter and duller streaks. It contains considerable mineral charcoal and is of a very glossy black color. It has a light gray ash.

No. (3) is of an average sample of the coal below the slate parting. It is also a hard, firm coal of brighter and duller streaks. It contains considerable mineral charcoal and in places is of a peacock color and on a fresh surface has a vitreous look.

On Frog Ague Creek about one-half of a mile below the Mt. Carmel out-cropping, there is near Mr. Justice's an other showing of coal which is doubtless of the same seam as the Mt. Carmel coal bed. In the N. W. ¼ of S. 4, T. 15, R. 6 W., on Big Cane Creek, about one-half of a mile a little east of north of the Mt. Carmel coal bed, there is the following out-cropping:

Section on Big Cane Creek,
in the N. W. ¼ of S. 4, T. 15, R. 6 W.

(10) *Shale, Sandstones;* the sandstone is in seams in the shale, which shows in thickness about	15 ft. 0 in.
(9) *Slate,* COAL; the coal is in thin sheets in the slate, it is cubical	3 in.
(8) *Slate*	1 in.
(7) COAL	2 ft. 5 in.
(6) *Slate*	1 in.
(5) COAL	3 ½ in.
(4) *Slate*	8 in.
(3) COAL	4 in.
(2) *Shale, Sandstone;* the shale is clayey and fossiliferous and contains thin seams of sandstone and *clay iron stone.* The upper part is very clayey and of a dark color	6 ft. 0 in.
(1) *Sandstone;* slabby, in the creek	4 ft. 0 in.

There is said to be, in the bed of the creek, under (1), more coal, if so it is a part of this same seam, which has split off. This out-cropping of coal, though it is some thirty-five to forty feet lower than the Mt. Carmel coal bed, is believed to be of the same seam. The coal at this out-cropping has a decided dip to the south-east, eight or ten feet in fifty yards, which is, of course, due to waves or other disturbances. Thin sheets of mineral charcoal occur along the horizontal plane of division or stratification in this coal. The following analysis of a sample of coal from this out-cropping was given by the State Geologist in his report for 1879-1880:

Specific Gravity	1.401
Sulphur	.482
Moisture	3.799
Volatile Matter	26.217
Fixed Carbon	57.316
Ash	12.668
	100.000

In the old Baltimore road, in the S. E. ¼ of S. 29, T. 14, R. 6 W., there is an out-cropping of coal from twelve inches to fourteen inches thick, and, in the N. E. ¼ of S. 9, T. 15, R. 6 W., there are several more coal out-croppings about 12 ins. thick, all of which are likely of the same seam. These last mentioned coal out-crops have a slate cover and an underbed of bluish clay or clay slate, and, though they are about on a level with the Mt. Carmel coal out-cropping, they are, in reality, thought to be of a seam much higher than the seam of the Mt. Carmel coal.

A seam of coal, five feet in thickness, is said to occur in the river just below the mouth of Frog Ague Creek, from which out-crop boat loads of coal, are said to have been raised and floated down the river. The thick coal seam or (7) of the *General Section*, the Jagger, Townley and Mt. Carmel seam, also crops-out in the S. E. ¼ of S. 9, T. 15, R. 6 W., where it has the following section ;

Section in S. E. ¼ of S. W. of S. 9, T. 15, R. 6 W.

(7)	*Shale*; a clayey fossiliferous slate, yellowish and knotted and curled		10 ft. 0 in.
(6)	Coal; much weathered and slaty, likely a bright hard bony coal	Upper bench	1 ft. 11 in.
(5)	*Mother of Coal;* soft and smutty		6 in.
(4)	*Clay;* parting		½ in.
(3)	*Slate;* parting		8 in.
(2)	Coal; *lower bench*		1 ft. 10 in.
(1)	*Slate*; underbed.		

In the bed of a branch, in the N. W. ¼ of S. E. ¼ of S. 16, T. 15, R. 6 W., something better than half of a mile a little east of south from the last out-crop, there is an other outcropping of coal, which is doubtless of the same thick seam, as follows :

Section in the N. W. ¼ of S. E. ¼ of S. 16, T. 15, R. 6 W.

(3)	*Shale;* clayey, knotted and curled, fossiliferous, and of a dark color. Forms a bluff, showing about	15 ft. 0 in.
(2)	Coal; with thin layers of mineral charcoal and much pyrites	2 ft. 7 in.
(1)	*Slate;* believed to be a parting, only the top of it visible.	

This out-cropping appears to be some fifteen feet lower than the one of the preceding section. Boat loads of coal are said to have been raised from this out-cropping, and floated down the river. Some seventy-five to eighty feet or more above this last out-cropping of coal, there occurs a seam of coal in Mr. Wm. Davis' well, in the N. E. ¼ of S. W. ¼ of S. 15, T. 15, R. 6 W. This well is reported by Mr. Davis to have the following section:

Section of Mr. Wm. Davis' Well,
in the N. E. ¼ of S. W. ¼ of S. 15, *T.* 15, *R.* 6 *W.*

(3)	DRIFT; rounded pebbles	8 ft.
(2)	*Slate*	10 ft.
(1)	COAL; in bottom of well, about	1 ft.

In Mr. Wm. Davis' field, in the S. E. ¼ of S. W. ¼ of S. 22, T. 15, R. 6, W., there is said to be an out-cropping of coal about twelve inches in thickness and some fifty feet above low water in the river. The seam of this out-cropping is thought to be fifty feet above the thick or *Mt. Carmel seam.*

Along the west bank of the river, below the mouth of Frog Ague Creek, there is a bluff of hard shales and shaly sandstones which tower some two hundred feet above the river; the naked perpendicular face of this bluff is alone some seventy-five feet high. On the crest of this bluff, there are many red cedars of seemingly a dwarfed or stunted growth, and from the bed of the river, below the bluff, many boat loads of coal are said to have been raised. Coal is also said to occur in the river, in Payne's mill pond, in the S. E. ¼ of S. E. ¼ of S. 9, T. 15, R. 6 W., five feet thick, and also just below the mill dam, in the S. W. ¼ of S. E. ¼ of S. 14, T. 15, R. 6 W., under a bluff twenty-five feet high. The rocks in this bluff dip to south-west.

Crossing to the east side of the river and digressing a little, we find the thick coal seam, (7) of the *General Section,* or the Jagger, Townley, Mt. Carmel, etc., seam, coming to the surface, some one hundred and fifty feet above the level of the river, in S. 33, T. 14, R. 5 W. and S. 4, T. 15, R. 5 W., in what is known, in that immediate neighborhood, as the

Jim Hawthorne seam. Near the center of S. 33, T. 14, R. 5 W., this seam of coal has been opened in two places by Mr. Howard Douglass, of the Milner Coal and Railroad Company. At the time visited, his pits had become partly filled with debris, but the following section of the coal, in one of them, was kindly given by Mr. J. F. Browder, who helped to dig these pits:

Reported Section of Jim Hawthorne's Coal Seam, near the Center of S. 33, T. 14, R. 5 W.

(10)	*Debris;* disintegrated shales.	
(9)	*Sandstones;* flaggy and massive, forming prominent bluffs around the ridges. Showing at this out-crop a thickness of only about	10 ft. 0 in.
(8)	*Debris*	10 ft. 0 in.
(7)	*Shale, Sandstones;* a hard, knotted, curled clayey shale, of a yellowish color, with thin seams of sandstone, showing	10 ft. 0 in.
(6)	*Slate;* a soft curled slate of a bluish color	3 ft. 0 in.
(5)	Coal	2 ft. 0 in.
(4)	*Slate;* black	6 in.
(3)	*Clay;* merely a streak.	
(2)	Coal; with likely thin partings of slate	5 ft. 0 in.
(1)	*Slate;* underbed.	

In these out-crops, the coal had a dip to the north-west. On the land of Jim Hawthorne, colored, after whom these out-crops, or this seam in his immediate neighborhood has been called, the out-crops have been dug into in several places, of which the following is about an average section, as reported:

An Average of Reported Sections of Jim Hawthorne's Coal Seam, in the S. W. ¼ of N. W. ¼ of S. 4, T. 15, R. 5 W.

(7)	*Shale;* clayey, of an orange color	20 ft. 0 in.
(6)	Coal	2 ft. 6 in.
(5)	*Slate*	2 in.
(4)	Coal	1 ft. 6 in.
(3)	*Slate*	2½ in.
(2)	Coal	3 ft. 0 in
(1)	*Slate;* bluish underbed.	

The State Geologist gives, on page 61 of his report for 1879–80, the following analysis of an average sample of the upper two feet of this seam of coal in these out-crops:

Specific Gravity	1.333
Sulphur	.516
Moisture	2.969
Volatile Matter	29.784
Fixed Carbon	60.598
Ash	6.649
	100 000

This analysis, though of a badly weathered sample from the out-croppings, shows the coal to be of an excellent quality.

This seam of coal was also struck in Mr. R. M. Morgan's well, on the Jasper and Democrat road, near the center of S. 4, T. 15, R. 5 W., where, as far as dug into, it had the following reported section:

Section of Mr. R. M. Morgan's Well, near the Centre of S. 4, T. 15, R. 6 W.

(6)	*Slate*; knotted and curled, clayey, and of an orange color, about		25 ft. 0 in.
(5)	COAL	Upper bench	3 ft. 6 in.
(4)	*Slate*		1 in.
(3)	COAL; very fine,		6 in.
(2)	*Slate*; soft and clayey, and of a bluish color, parting		5 in.
(1)	COAL; forming bottom of well, lower bench.		

Two out-crops of this seam of coal show between Mr. R. M. Morgan's and Jim Hawthorne's, or about one-fourth of a mile north-east of Mr. Morgan's. One of these out-crops is in a natural mound not more than fifty feet in diameter and ten feet high, the other is in the Phillips' Ferry road. The coal in both instances dips to the north-west.

Along the Jasper and Elyton road, in S. 4, T. 15, R. 5 W., there crops out the following section:

Section along the Jasper and Elyton Road, in S. 4, T. 15, R. 5 W.

(8) *Shale*; knotted and curled, clayey and of an orange color	25 ft. 0 in.
(7) COAL; Jim Hawthorne's seam, about	7 ft. 0 in.
(6) *Measures*; about	100 ft. 0 in.
(5) COAL; good and hard, though a little slaty. Said to be about four feet thick, though the out-crop does not appear to be more than	1 ft. 6 in.
(4) *Slate*	1½ in.
(3) COAL; good, breaking out into rectangular blocks of full thickness of the coal	2 in.
(2) *Slate*; clayey and bluish, underbed, showing	1 ft. 6 in.
(1) *Debris.*	

The rocks near this lower out-cropping of coal are in waves, which run from the north-east to the south-west, though the strata sometimes form bulges or low hillocks, from whose summits the rocks dip in all directions.

A seam of coal, four feet in thickness, is said to be in the well at old *Democrat* P. O., 37 feet below the surface, and in a well at Middleton P. O., 21 feet beneath the surface.

The line between Walker and Jefferson counties runs along the top of *Democrat ridge*, until this ridge gradually dies away, close down in the Fork of Big and Little Warrior rivers. This *Democrat ridge* is the most south-western terminus of the great Sequatchie fold of Tennessee. Ponds or sinks are common along the summit of this flat terminal ridge, which here goes by the name of *flat woods*, as it has no sudden elevations or depressions of any considerable size. The largest growth of these *flat woods* is long-leaf pine and the main growth is oak, which has scattered along through it some hickory and short-leaf pine.

On the head waters of Horse Creek, the country is very broken and the out-crops of coal are numerous. On the side of a branch in S. 6, T. 15, R. 5 W., there is an out-cropping of coal which shows down to a depth of about four feet. It has a cover of a bluish slate, a few inches in thickness, and then a fossiliferous clayey shale of an orange color, which becomes very hard towards the top and forms bluffs with *rock-houses*. This coal is doubtless an out-cropping of the Hawthorne, Mt. Carmel, etc., seam. The rocks near this out-cropping of coal have a dip to the south of about 8°. Not far from Mr. M. C. Morgan's and about one-half of a mile west of the last coal outcropping, and seemingly some fifty feet above it, there is an other out-cropping of coal, which has about the following section:

Section near Mr. M. C. Morgan's, in S. 6, T. 15, R. 5 W.

(4) *Debris*; loose, massive sandstones, etc.
(3) *Slate;* clayey, fossiliferous and of an orange color. 4 ft. 0 in.
(2) COAL; extending as far down as could be seen, showing about. ....2 ft. 0 in.
(1) *Debris, Sandstones;* the sandstones are flaggy and slabby. To bed of creek. About.. .... 60 ft 0 in.

This coal is probably (8) of the *General Section*, or of the same seam as the *Baker's lower bed* on Lost Creek. South of Mr. M. C. Morgan's, some three-fourths of a mile, in S. 7, T. 15, R. 5 W., near Mr. Newt. Davis', the following section occurs:

Section near Mr. Newt. Davis', in S. 7, T 15, R. 5 W.

(5) *Sandstones*; slabby and flaggy, broad and flat, forming bed of branch above *the fall* and cover to rock-house below and behind *the fall*. ....15 ft. 0 in.
(4) *Shale*; forming, as it occurs in the face of the bluff, a hard compact rock, into which the rock-houses have been cut. Showing in the bluff a thickness of about.........12 ft. 0 in.
(3) *Debris*; at foot of bluff....... .... 4 ft. 0 in.
(2) COAL; showing as far down as could be seen. A hard, bright coal ... ...2 ft. 0 in.
(1) Debris.

This out-cropping of coal is at the head of a ravine, terminated by a crescent shaped bluff with *rock-houses*, over which the water of the branch that has washed out this ravine has a clear leap of about twenty feet. This coal is believed to be of the same seam as that near Mr. M. C. Morgan's. The rocks here appear to dip towards the south.

Mr. T. W. Davis' coal bed, in the N. E. ¼ of S. E. ¼ of S. 12, T. 15, R. 6 W., crops out at the head of a ravine from under a similar *water fall* and crescent shaped bluff as the one of the last section. This coal out-crop of Mr. T. W. Davis' is said to be three feet thick; it is covered by hard shales, with three seams of sandstones, which form a bluff about fifteen feet high. This coal is of the same seam as the coals of the last two sections, and is some eighty to ninety feet above the river, and dips apparently a little west of south.

In the bed of a branch, in S. 18, T. 15, R. 5 W., there is said to be coal; at the time visited, it was hid by debris; above it is a bluff of yellow clayey shale, with a dip of about 10° to the south-west. This coal is more than likely (7) of the *General Section*, or of the Hawthorne, Mt. Carmel, etc. seam. Two out-crops of this thick seam (Mt. Carmel, etc.) occurs on the same branch as the above, as it runs through Mr. R. M. Morgan's old place, in the S. W. ¼ of S. 18, T. 15, R. 5 W. The most south-western of these outcrops, or the one lowest down the branch, has the following section:

Section of Lower Coal Out-crop, on Mr. R. M. Morgan's Old Place, in S. W. ¼ of S. 18, T. 15, R. 5 W.

(7) *Slate*; clayey, fossiliferous, and of an orange color, with light blue streaks. .... 3 ft. 0 in.
(6) COAL; slaty and badly weathered, soft and brittle. About.......... .... 2 ft. 0 in.
(5) *Clay*......... .... 3 in.
(4) *Shale*; black and slaty and clayey.................. 7 in.
(3) COAL; badly weathered, soft and shaly, showing above water in pit, about.............................. 4 ft. 0 in.
(2) COAL; under water, measured with stick.... ... 1 ft. 3 in.
(1) *Slate*; reported.

At the other out-cropping, some hundred and fifty yards up the branch, north-east from the one above, there is the following exposure;

Section of Upper Coal Out-crop on Mr. R. M. Morgan's Old Place, in S. W. ¼ of S. 18, T. 15, R. 5 W.

(8)	*Slate*; clayey and fossiliferous and of an orange color.	
(7)	COAL; badly weathered, and shaly and easily crumbled	2 ft. 6 in.
(6)	*Slate*	2 in.
(5)	COAL	4 in.
(4)	*Clay*	2 in.
(3)	*Shale;* soft, clayey and black	7 in.
(2)	COAL; only a few inches of the top visible.	
(1)	*Debris.*	

Though this out-cropping of coal is of the same seam and is several feet higher than the last mentioned coal out-crop lower down the branch, still it dips away from that out-crop, hence the coal seam is waving and there is a crest of a wave between these two coal out-crops. Both of these coal out-crops have poor or thin covers and are badly weathered, to which, in a great measure, are doubtless due the soft and crumbly character of their coals. Some twenty feet above and about one-fourth of a mile east of this last coal out-cropping, there is a showing of coal in the road, which is probably of (8), *General Section*, or of the same seam as *Baker's lower bed.* Still a little farther east, at a spring on the side of the road, there is another out-cropping of coal.

The Mt. Carmel, Hawthorne, etc., seam crops out in several places in the S. E. ¼ of N. W. ¼ of S. 18, T. 15, R. 5 W., where it has the following section :

Section in S. E. ¼ of N. W. ¼ of S. 18, T. 15, R. 5 W.

(6)	*Slate;* clayey, fossiliferous and yellow.	
(5)	COAL; very shaly, *upper bench.*	From. . .2 ft. to 3 ft. 6 in.
(4)	*Fire Clay*	2 in.
(3)	*Slate*	5 in.
(2)	COAL; much weathered, shaly. Likely it is a hard, bony coal before weathering. *Lower bench*	4 ft. 6 in.
(1)	*Slate.*	

These coal out-crops are from sixty to seventy feet above the level of the river. This same thick seam of coal in an out-crop in the S. E. ¼ of S. E. ¼ of S. 13, T. 15, R. 6 W., has the following section:

Section in S. E. ¼ of S. E. ¼ of. S. 13, *T.* 15, *R.* 5 *W.*

(12)	*Shale;* clayey, fossiliferous and yellow cover.		
(11)	Coal; very slaty, upper bench		3 ft. 0 in.
(10)	*Clay.*	parting.	1 ½ in.
(9)	*Slate.*		6 in.
(8)	Coal; bony and hard	Lower bench.	1 ft. 2 in.
(7)	*Slate*		1 in.
(6)	Coal		6 in.
(5)	*Slaty Sandstone;* of a dark color, with thin streaks of *coal*		2 in.
(4)	Coal; bony and very hard, with bright and dull streaks		9 in.
(3)	*Slate*		1 ½ in.
(2)	Coal; very slaty		4 in.
(1)	*Slate*; contains thin seams of *clay iron stone,* extending down to bed of branch. Showing		15 ft. 0 in.

The above coal, though bony, is a hard good coal, with bright and dull streaks; it dips seemingly to the east of south.

Approximate Section along Coal Bed Hollow, in the S. E. ¼ of S. E. ¼ of S. 13, *T.* 15, *R.* 6 *W.*

(10)	*Measures;* to level of country, about	125 ft. 0 in.
(9)	Coal; Hawthorne, Mt. Carmel, etc. seam	7 ft. 0 in.
(8)	*Shales, Sandstones*; contain impression of coal plants; the shales are blue and the sandstones are shaly	25 ft. 0 in
(7)	*Sandstone;* massive	4 ft. 0 in.
(6)	*Sandstones, Shales;* sandstones are slabby	12 ft. 0 in.
(5)	*Shales;* fossiliferous	3 ft. 0 in.
(4)	Coal; showing about	1 ft. 2 in.
(3)	*Shales;* soft and blue, and full of fossils	15 ft. 0 in.
(2)	*Sandstones, Shales*; forming a bluff	30 ft. 0 in.
(1)	Coal; a hard coal with bright and dull streaks, cropping out in bed of branch, said to have been dug into, without getting through it, several feet.	

The coal in these out-crops seem to dip towards the south.

The Mt. Carmel, Hawthorne, etc., coal seam also makes its appearance in the N. E. corner of S. 24, T. 15, R. 6 W.

and, seemingly, some seventy-five feet above it, in the N. W. ¼ of S. E. ¼ of S. 24, T. 15, R. 6 W., there is the following out-cropping of coal which is believed to be of (8) of the *General Section*:

Section of Coal Out-Crop,
in the N. W. ¼ of S. E. ¼ of S. 24, T. 15, R. 6 W.

(6)	*Slate.*	
(5)	COAL; slaty and bony	1 ft. 6 in.
(4)	COAL; good and hard	1 ft. 7 in.
(3)	*Slate.*	1 ¼ in.
(2)	COAL; good and firm	9 in.
(1)	*Slate.*	

This coal, in its out-crop, seems to be an exceptionally pure and firm coal. An average sample gave the following analysis:

Specific Gravity	1.339
Sulphur	slight trace.
Moisture	1.662
Volatile Matter	26.265
Fixed Carbon	61.560
Ash	10.513
	100.000

The above coal is a very hard coal and would well bear transportation. On a fresh surface, it is a glossy black. It cokes well and has a light gray ash. Though, in the above out-cropping, it is some seventy-five feet above an out-cropping of the Mt. Carmel seam in an adjoining *forty* (acres), it is believed to be of a seam not half this distance above the Mt. Carmel seam or of the same seam as *Baker's lower bed.* Some twenty-five feet lower than this last coal out-cropping, there is a *deer lick,* which we believe to be on the covered out-cropping of a coal seam.

In the road, near the foot of the ridge, on which Mrs. Davis' house stands, in the S. W. corner of S. 24, T. 15, R. 6 W., there shows, in the disintegrated rocks, the following out-crop of coal, which we believe to be only a poor or partial exposure of the Mt. Carmel seam:

Section in S. W. ¼ of S. W. ¼ of S. 24, T. 15, R. 6 W.

(5)	*Measures;* to top of hill, about	75 ft. 0 in.
(4)	*Slate*; clayey	1 ft. 8 in.
(3)	Coal; showing about	8 in.
(2)	*Clay*	4 in.
(1)	Coal; showing about	8 in.

In the bottom of Mrs. Davis' well, there is said to be a seam of coal, which has been dug down into, at the least, two feet. These two seams of coal must be some forty feet apart, and hence, if the former is the Mt. Carmel, as supposed, the latter is the *Baker's lower bed seam.*

Coal is said to be in Horse Creek, in the S. W. ¼ of S. E. ¼ of S. 24, T. 15, R. 6 W., which is, seemingly, of a seam below the Mt. Carmel. The Mt. Carmel seam crops out, in the same *forty* as is the last coal out-cropping, as follows:

Section of Coal Out-Cropping in S. W. ¼ of S. E. ¼ of S. 24, T. 15, R. 6 W.

(11)	*Shale;* curled, forms a bluff	15 ft. 0 in.
(10)	*Clay*	2 in.
(9)	Coal; bony and a little slaty	2 ft. 6 in. to 3 ft. 0 in.
(8)	Coal; good, breaking up into cubical blocks	5 in.
(7)	*Slate*	¾ in.
(6)	Coal	4 ½ in.
(5)	*Slate*	1 ½ in.
(4)	Coal; very hard and bright, a little bony	1 in.
(3)	*Slate*	5 in.
(2)	Coal; seen to a depth of	6 in.
(1)	*Debris, Slate.*	

At *Davis' Coal Yard,* in the N. W. ¼ of S. W. ¼ of S. 24, T. 15, R. 6 W., in the bed of Horse Creek, there is said to be three feet of coal, then a slate parting five inches thick with more coal below it. Coal was raised and boated off from this bed or from this yard, between the years 1840 and

1872. Coal is also said to occur in Horse Creek in the N. E. ¼ of S. 26, T. 14, R. 6 W. The State Geologist gives in his report for the year 1879-1880, on page 56, the following analysis of selected samples of this coal in Horse Creek, which were taken from piles that had been lying on the banks for fifteen to twenty years:

Specific gravity	1.365
Sulphur	7.11
Moisture	1.848
Volatile matter	28.365
Fixed carbon	58.213
Ash	11.574
	100.000

The State Geologist also gives, in the above report, the following out-cropping at the *Robinson's Coal Bed*, which is on a small tributary of Horse Creek, near its mouth, and, though some 25 feet above the coal out-cropping in Horse Creek, it is doubtless of the same seam:

Section of Coal Out-cropping, at the Robinson Bed, on Horse Creek, in S. 26, T. 15, R. 6 W.

(10)	*Sandstones;* bluish, slaty	15 ft. 0 in.
(9)	*Clay Slate;* bluish, fossiliferous	1 ft. 6 in.
(8)	COAL; good, a little bony on top	1 ft. 0 in.
(7)	*Black Slate;* parting	⅛ in.
(6)	COAL; good, hard, bright	10 in.
(5)	*Bluish Slate;* parting	⅛ in.
(4)	COAL; good, hard, bright	10 in.
(3)	*Black Shale*	½ in.
(2)	COAL; good, hard	4 in.
(1)	*Clay Slate.*	

This out-cropping of coal is like the *upper bench* of the Mt. Carmel coal seam. Two average samples of coal from the above out-cropping at the *Robinson bed* gave the following analyses:

	(1)	(2)
Specific Gravity	1.371	1.364
Sulphur	.580	.599

Moisture	2.454	2.703
Volatile Matter	27.007	26.600
Fixed Carbon	57.650	56.367
Ash	12.989	14.330
	100.000	100.000

In Flat Creek, the next creek up the river from Horse Creek, about one-fourth of a mile from its mouth, or in the N. W. ¼ of N. W. ¼ of S. 23, T. 15, R. 6 W., there is said to be an out-cropping of coal two feet in thickness. A sample of the upper eight inches of this coal out-cropping gave the following analysis:

Specific Gravity	1.362
Sulphur	1.516
Moisture	1.674
Volatile Matter	33.199
Fixed Carbon	54.540
Ash	10.287
	100.000

These out-croppings of coals in Horse and Flat creeks, near their mouths, are doubtless of the Mt. Carmel seam, or (7) of the *General Section.*

Mr. M. W. Morgan, who lives in S. 14, T. 15, R. 6 W., says that three different seams of coal crop out in his neighborhood. The top one, he says, is about eight inches thick; the second or middle one is one foot six inches thick, and the bottom one is six feet thick. They are most likely of (7), (8) and (9) of the *General Section*, or of the same seams as the *Baker's upper and lower beds*, and the *Mt. Carmel bed.*

In the bed of Barton's Creek, near its mouth, or in the N. E. ¼ of S. 34, T. 15, R. 6 W., some twelve feet above low water in the river, there is an out-cropping of coal, which is reported to be three feet thick, and to have furnished one or more boat loads of coal to the Mobile market in ante-railroad times in Alabama. It is probably (8) of the *General Section*, as an out-cropping of coal eight feet in thickness, which is of the next underlying or *Mt. Carmel seam*, is said to be in the river in the S. W. ¼ of S. 1, T. 16, R. 6 W.

Across the river from the Tuggles' bend, there crops out in the S. W. corner of S. 2, and S. E. corner of S. 3, T. 16, R. 6 W., the following section:

Section in S. W. corner of S. 2, and S. E. corner of S. 3, T. 16, R. 6 W.

(14) *Shales, Sandstones*; principally shales with thin seams of sandstone. Also, some thin seams of *iron stone* in the shale. Form a bluff.............................80 ft. 0 in.
(13) *Shales*; stained an orange color in places, in other places almost an iron rock.......................... 2 ft. 0 in.
(12) COAL; at foot of bluff, very irregular, furnishing several chalybeate springs. About..................... 1 ft. 0 in.
(11) *Shales, Sandstones, Debris*; the shales, with thin seams of sandstone, form a bluff.......................30 ft. 0 fn.
(10) COAL; mixed through several feet of disintegrated shales; it may be of a slide........................ 2 ft. 0 in.
(9) *Debris*.................................15 ft. 0 in.
(8) *Slate*; showing............................. 4 ft. 0. in
(7) *Sandstones*; massive......................... 4 ft. 0 in.
(6) *Slate*; yellow.............................. 1 ft. 0 in.
(5) COAL; it has no partings...........from 2 ft. to 2 ft. 2 in.
(4) *Slate*; clayey, very fossiliferous, hardenining in places to a hard rock.............................. 1 ft. 6 in.
(3) *Sandstones*; massive, slabby, and a little shaly on top, showing above water about....................... 6 ft. 0 in.
(2) *Measures*; supposed to be about...............10 ft. 0 in.
(1) COAL; in bed of river in S. W. ¼ of S. 1, T. 16, R. 6 W., said to be.................................. 8 ft 0 in.

Coals, (1), (5) and (10), are doubtless respectively (7), (8) and (9) of the *General Section*. Coal is said to be in Jones' Creek, opposite the *Shepard's bend*, about one mile from its mouth or from the river.

Along Burnt Cane Creek and its branches, there are numerous out-crops of coal. The following is a reported section by Prof. Tuomy of one of the lower coal out-croppings on Burnt Cane Creek:

Coal Out-cropping on Burnt Cane Creek.

(7)	COAL.	Upper bench	3 ft. 2 in.
(6)	*Shale*		2½ in.
(5)	COAL		2 in.
(4)	*Shale*; parting		8 in.
(3)	COAL	Lower bench	10 in.
(2)	*Shale*		1½ in.
(1)	COAL		8 in.

This seam of coal crops out in the banks of a branch in *Beechy Hollow*, in the N. W. ¼ of S. 6, T. 16, R. 5 W., in what is called the *Stevens' Coal Bed*, that has about the following section:

Section of Stevens' Coal Bed, in N. W. ¼ of S. 6, T. 16, R. 5 W.

(9)	*Slate*; clayey, curled and yellowish, showing about	10 ft.
(8)	*Clay*; about	2 in.
(7)	COAL	2 ft. 9 in.
(6)	*Slate*	½ in.
(5)	COAL	5 in
(4)	*Slate*; clayey, soft and of a gray color	2 in.
(3)	COAL; as far down as could be seen	5 in.
(2)	*Debris*	2 ft.
(1)	*Black Slate* or *Mother of Coal;* forming the bed of the branch.	

The State Geologist, in his report for 1879–80, gives, on page 55, the following section of the above coal out-cropping in *Beechy Hollow:*

Section of Beechy Hollow Seam,
in the N. W. ¼ of S. 6, T. 16, R, 5 W.

(13)	COAL; good	3 in.	Upper Bench, 3 ft. 5½ in.
(12)	*Parting*	¼ in.	
(11)	COAL; good	3½ in.	
(10)	*Parting*; streak.		
(9)	COAL	1 ft 7½ in.	
(8)	*Black slate*	¾ in	
(7)	COAL	6 in	
(6)	*Slate*	2 in.	
(5)	COAL	1½ in.	
(4)	*Slate*; parting	9 in.	
(3)	COAL	6 in.	Lower Bench, 1 ft. 4 in.
(2)	BONY COAL	1 in	
(1)	COAL	9 in.	

An average, though much weathered sample, representing the full thickness of the above out-cropping of coal, less the partings, gave the following analysis:

Specific Gravity	1.439
Sulphur	.527
Moisture, at 110°C	6.952
Volatile Matter	27.065
Fixed Carbon	55.640
Ash	10.343
	100.000

This coal is (7) of the *General Section*, or is of the same seam as the Mt. Carmel, Hawthorne, etc., beds.

Mr. Joshua Barnes has two coal beds in T. 16, R. 5 W.; one of them is in the S. E. ¼ of S. 6, and the other is in the S. W. ¼ of S. 5. They are on a branch, about one mile from its mouth or from Burnt Cane Creek. From these outcrops boat loads of coal were raised and *floated on freshets* down the river to Mobile. The last boat load of coal that was taken from these beds is said to have been raised the year after the war.

The following is an approximate general section, including the seams of these two beds of coal:

Approximate Section near Mr Joshua Barnes, in the S. E. ¼ of S. 6, T. 16, R. 5 W.

(13) *Measures;* about ....80 ft. 0 in.
(12) COAL; thickness undetermined.
(11) *Measures*; about ....100 ft. 0 in.
(10) COAL; about ....1 ft. 0 in.
(9) *Measures*; about ....30 ft. 0 in.
(8) COAL; about ....1 ft. 6 in.
(7) Measures; about ....25 ft. 0 in.
(6) COAL; said to have a slate parting near the center, and that the coal below the parting is much brighter and harder than that above, Barnes' *upper bed.* Said to be....3 ft. 6 in.
(5) *Debris* ....10 ft. 0 in.
(4) *Sandstones;* flaggy and slabby, and forming a bluff, about ....15 ft. 0 in.

(3)	*Slate, Debris;* the slate soft and gray	6 ft. 0 in.
(2)	COAL; below bed of the branch in the field, *Barnes' lower bed*, said to be	5 ft. 6 in.
(1)	*Slate*; reported.	

These coals of the Barnes' beds are (7) and (8) of the *General Section*, and the boat loads of coal that were taken from them were raised after the primitive method of throwing off the cover. The strata hereabouts have a dip of 6° to 8° to the north-west. The higher of these beds or (6) of the above section is about ¼ mile south of the other. It crops out from just under a bluff of shaly and slabby sandstones, which are prominent all around the ridge, and which has in them and under them many rock-houses. About 100 feet above *Mr. Barnes' upper bed*, there is an out-cropping of coal on the side of the high ridge or divide, in the N. W. ¼ of N. E. ¼ of S. 7, T. 16, R. 5 W. Between the *Stevens'* and *Barnes' coal beds*, there is said to be a good many out-crops of coal along the creeks and branches, but, at the time visited, there was too much water in the creeks and branches to see these out-croppings. They are doubtless of the same seams as the *Barnes' beds*. The coal seam of *Barnes' upper bed* is said to also crop out on the opposite or south-side of the ridge south of the *Barnes' beds*. This is doubtless also the same seam that is said to crop out on the side of a ridge in the N. W. ¼ of S. E. ¼ of S. 32, T. 15, R. 5 W. About ¼ mile south-east of this reported coal out-cropping, there is in the bed of *Rocky branch*, in the N. W. ¼ of S. E. ¼ of S. 32, T. 15, R. 5 W., the following coal out-crops:

Coal Out-crops on Rocky Branch,
in the N. W. ¼ of S. E. ¼ of S. 32, T. 15, R. 5 W.

		(1)	(2)
(9)	*Earth.*		
(8)	COAL; visible, about	8 in.	8 in.
(7)	*Slate*; about	9 in.	7 in.
(6)	COAL; about	5 in.	1 in.
(5)	*Slate*	5 in.	5 in.
(4)	COAL	4 in.	COAL 8 in.
(3)	*Slate*	½ in.	
(2)	COAL	3 in.	
(1)	*Fire clay;* bed of creek visible	4 in.	4 in.

No. 2 is about 250 yards up the creek from No. 1, or southeast of No. 1. They are both of the same seam which is doubtless that of *Barnes' lower bed*, or (7) of the *General Section.* Farther up Rocky branch, or in the S. W. ¼ of S. E. ¼ of S. 32, T. 15, R. 5 W., there are the following outcrops, which are doubtless parts of the same thick slaty seam as the above:

Out-crops on Rocky Branch,
in the S. W. ¼ of S. E. ¼ of S. 32, T. 15, R. 5 W.

	(1)	
(7)	Debris.	
(6)	*Slate*; visible	8 in.
(5)	Coal	8 in.
(4)	*Slate.*	8 in.
(3)	Coal	10 in.
(2)	*Clay Slate*	2 in.
(1)	*Sandstone.*	

	(2)	
(5)	*Debris.*	
(4)	Coal	10 in.
(3)	*Debris*	3 ft. 0 in.
(2)	Coal; visible	1 ft. 3 in.
(1)	*Fire Clay.*	

Section (2) is a few steps farther up the creek than (1). These sections are of parts of the same seam and may partly overlap, though they have no similarity. About ¼ mile still farther up Rocky Branch, or in the S. E. ¼ of N. E ¼ of S. 5, T. 16, R. 5 W., there is an other coal out-cropping, which is doubtless of the same seam; it shows as follows:

Out-cropping in the S. E. ¼ of N. E. ¼ of S. 5, T. 16, R. 5 W.

(7)	*Sandstones.*	
(6)	*Earth, Debris;* about	7 ft. 0 in.
(5)	*Smut*; would likely lead back to *coal*	1 ft. 6 in.
(4)	Coal	6 in.
(3)	*Slate;* with some little streaks of *coal*	1 ft. 6 in.
(2)	Coal; very good	8 in.
(1)	*Slate;* forming bed of branch.	

Several hundred yards still higher up Rocky Branch, this seam of coal again crops out in the bed of Rocky Branch, where it appears to be on top of a wave and to be a part of the seam below (1) of the above section, or below the bed of the branch at that out-cropping. In this last out-cropping the coal shows about fourteen inches thick, and has an underbed of fire clay and a cover of debris.

In the old Oaky Hollow road, south of its crossing of Rocky Branch, or in the N. W. ¼ of N. E. ¼ of S. 5, T. 16, R. 5 W., there is an out-cropping which, though it shows only six inches of coal, is believed to be of the next seam above the thick slaty seam along Rocky Branch, or is thought to be of the same seam as *Barnes' upper bed.* About three-quarters of a mile farther north, this same seam crops out again in the old Oaky Hollow road, near Mr. Andrew's, or in the S. W. ¼ of N. E. ¼ of S. 32, T. 15, R. 5 W., but this time it shows to a thickness of about three feet. These coal out-crops have all a dip of 6° to 8° to the north-west.

On a branch in the N. E. ¼ of S. 30, T. 15, R. 5 W., near old Shulough P. O., or near Mr. R. J. Morgan's, there is an out-cropping of coal which is said to be about two feet in thickness. It has an excellent reputation with the neighborhood blacksmiths. It is likely (9) of the *General Section.*

IV. Belt 3. The Out-crops of Coal on Cane and Wolf Creeks and Lower Lost Creek, and on Baker Creek, and on the River between the Mouths of Lost and Baker Creeks.

The country on the head waters of Wolf and Cane creeks is very broken and shows many out-crops of coal. On the waters of Wolf Creek, in the S. E. ¼ of N. E. ¼ of S. 31, T. 14, R. 9 W., there is an out-cropping of good coal which is known as the *James Rutledge coal bed.* It is always under water, but it is said to have been dug down into, at the least, one and one-half feet. In a well in the S. E. ¼ of S. W. ¼ of S. 29, T. 14, R. 9 W., there is an excellent coal, so said, that is twenty inches in thickness, and in the N. E. ¼ of N. W. ¼ of S. 32, T. 14, R. 9 W., there is an out-cropping of coal that is ten inches thick. These out-crops of coal are probably of (9) of the *General Section.*

Mr. R. E. Harris has a coal bed, cropping out with the following section in the banks of a branch, in the N. E. ¼ of N. E. ¼ of S. 34, T. 14, R. 9 W:

Section of Mr. R. E. Harris' Coal Bed,
in the N. E. ¼ of N. E. ¼ of S. 34, T. 14, R. 9 W.:

(7)	*Shale;* clayey, of an orange color, showing for	8 ft. to 10 ft. 0 in.
(6)	*Slate;* of a dark color	6 in.
(5)	Coal; slaty on out-crop	6 in.
(4)	*Slate;* clayey	6 in. to 9 in.
(3)	Coal; good and hard	1 ft. 6 in.
(2)	*Slate*	1 ½ in.
(1)	*Sandstone;* underbed.	

This coal is doubtless the upper part of (13) of the *General Section,* which has here been divided or split into two parts. In a well and in a branch, in this same section, there are out-crops of coal, which are, seemingly of a seam lower than the above. They may be of the under split of (13) of the *General Section.* In the S. W. ¼ of S. E. ¼ of S. 35, T. 14, R. 9 W., there is an out-cropping of coal six inch. thick with a clay underbed and slate cover. On Mr. R. E. Harris' land, in the S. W. ¼ of S. W. ¼ of S. 3, T. 15, R. 9 W., on the side of a high ridge or divide, some fifty feet above Wolf Creek, there is an out-cropping of coal which is said to be three feet in thickness. It is doubtless of the same seam as Mr. Harris' other bed, in the N. E. ¼ of N. E. ¼ of S. 34, T. 14, R. 9 W. or of the last section. Mr. J. E. Windham has a coal bed on the very head waters of Cane Creek, in the N. W. ¼ of S. W. ¼ of S. 6, T. 15, R. 8 W. It has the following section:

Section of Mr. J. E. Windham's Coal Bed,
in N. W. ¼ of S. W. ¼ of S. 6, T. 15, R. 8 W.

(4)	*Shale;* clavey, yellow.	
(3)	Coal; hard and solid, no parting	2 ft. 2 in.
(2)	*Slate*	2 in.
(1)	*Sandstone;* underbed.	

This coal is doubtless of the same seam as the R. E. Harris' coal beds. Coal occurs in Mr. J. L. Wright's well, in the S. W. ¼ of S. W. ¼ of S. 31, T. 14, R 8 W., and crops out in the S. E. ¼ of S. W. ¼ of S. 35, T. 14, R. 9 W., and N. E. ¼ of N. E ¼ and N. E. ¼ of S. W. ¼ of S. 31, T. 15, R. 9 W. These coal out-crops are all likely of the upper and under splits of (13) of the *General Section.*

A seam containing two feet of coal or five feet of slate and coal together, is said to occur in Mr. H. W. Isbell's well in the S. W. ¼ of N. W. ¼ of S. 23, T. 15, R. 9 W. This same seam of coal is said to be two feet and three inches thick in Mr. J. M. Crownover's well in the N. E. ¼ of S. E. ¼ of S. 22, T. 15, R. 9 W.. It also crops out in a ravine between these two wells. These wells are on top of the ridge or divide between Wolf and Cane creeks. This ridge is some three hundred feet high and hence the seam of coal which crops out in these wells, must be over two hundred feet above the seam of the *Harris beds.* Some twenty-five feet from the top of this divide, in the road above the *Harris bed No.* 2, in the S. W. ¼ of S. W. ¼ of S. 3, T. 15, R. 9 W., there is a perpetual spring which more than likely flows from the hidden coal seam of the Isbell and Crownover wells.

The *Thacker coal bed,* in the S. E. ¼ of S. E. ¼ of S. 13, T. 15, R. 9 W., has the following section:

Section of Thacker Coal Bed,
in the S. E. ¼ of S. E. ¼ of S. 13, *T.* 15, *R.* 9 *W.*

(6)	*Measures;* to top of divide about	200 ft. 0 in.
(5)	*Slate*; showing about	3 ft. 0 in.
(4)	COAL	1 ft. 3 in.
(3)	*Slate*	2 in.
(2)	COAL	2 ft. 0 in.
(1)	*Sandstone;* underbed.	

This coal is of the same seam as the *Harris beds.* It is a good, hard, bright, laminated coal, especially that below the slate parting, and is cut up by perpendicular planes of division which run through the coal in a general north-east and south-west direction. The coal at this out-crop appear to dip to the N E N., though the dip is more likely to the N W N.

This same seam of coal also crops out about two miles south-west of the above Thacker bed or just over the divide between Cane and Wolf creeks, in S. 26, T. 15, R. 9 W. On this out-cropping are the mines of the "Alabama and Virginia Mining & Manufacturing Company," which are known as the "*Patton Coal Mines.*" These mines, at present, consist of two drifts. Drift No. 1 is in the N. W. ¼ of S. W. ¼ and Drift No. 2 is in the S. E. ¼ of N. W. ¼ of S. 26, T. 15, R. 9 W. At the mouths of these drifts and in Drift No. 2, the seam of coal has the following sections:

Sections of the Coal Seam at Patton Mines,
in S. 26, T. 15, R. 9 W.

		(1)	(2)	(3)	(4)
(5)	*Shale;* good cover.				
(3)	COAL....	1 ft. 2 in.	9 in.	1 ft. 2½ in.	1 ft. 2 in.
(3)	*Slate*	2½ in.	2 in.	2½ in.	1½ in.
(5)	COAL ...	2 ft. 7 in.	2 ft. 5 in.	2 ft. 3½ in.	2 ft. 8 in.
(1)	*Fire Clay*			1 ft. 6 in.	

Of the above sections, (1) and (2) are of the out-crops at the mouths of Drifts Nos. 1 and 2, respectively, and (3) and (4) are within Drift No. 2. No. (4) occurs some fifty yards south-east of (3). In Drift No. 1, a fault is said to have been struck, and in Drift No. 2, the coal thickens towards the south-east. For two feet above the coal in section (2), or at the mouth of Drift No. 2, there are thin seams of coal running through the shale, and just over the coal of section (1), or at the mouth of Drift No. 1, there is about 2 inches of soft clay slate. The coal at these mines is said to have a dip of about fifty-seven feet to the mile to the south-east. As the dip of this same seam at the Thacker bed is to the north-east or north-west, there must be a fold in the strata between the Thacker bed and these mines. The coal of these mines is a good, hard, free-burning coal, and is known in the markets as the *peacock* and *splint coal.* Though these mines were opened only in 1884, and the company were busy much of the time in making outside improvements, and there was often a great scarcity of cars, they had an out-put, so it is said, for the year 1885 of about 50,000 tons of coal, which was expected to be increased to 75,000 tons for 1886. A short branch road, about one mile long, connects these mines with the Ga. P. R. R.

This same seam of coal also crops out about one mile south-west of the Patton Mines, at what was formerly known as the *Geo. Gaines' coal bed*, and is now the mines of the "Alabama and Mississippi Coal Company," at the mining town of Corona, in the S. E. ¼ of S. W. ¼ of S. 27, T. 15, R. 9 W. These mines have, within the last twelve months, been leased to F. C. Dunn & Co., who now mine and ship the celebrated "Corona Coal."

The following section of the strata, both above and below the drainage level, at this coal out-cropping, or at these mines, was given by Major W. J. Kelley, the superintendent of these mines under their old regime:

Section by Major W. J. Kelley, of Strata above and below Drainage Level at the Corona Mines, in the S. E. ¼ of S. W. ¼ of S. 27, T. 15, R. 9 W.

(14)	*Sandstones, Debris*; to top of Gaines' Peak		25 ft. 0 in.
(13)	COAL; Crownover and Isbell's wells		1 ft. 0 in.
(12)	*Shales, Sandstones;* principally shales with thin seams of sandstone		275 ft. 0 in.
(11)	COAL 1 ft. 2 in. *Slate* 3 in. COAL 2 ft. 0 in	*Gaines' Bed,* or *Corona Coal.*	3 ft. 5 in.
(10)	*Fire Clay.*		
(9)	*Measures*		17 ft. 0 in.
(8)	COAL		4 in.
(7)	*Measures*		8 ft. 0 in.
(6)	COAL		3 in.
(5)	*Measures*		14 ft. 0 in.
(4)	COAL		2 in
(3)	*Measures*		44 ft. 0 in.
(2)	COAL		3 in.
(1)	*Measures;* to bottom of bored hole		17 ft. 0 in.

From (1) to (9), inclusive, of this section are the results of a boring, or are below drainage level at this point, and from (9) to (14), inclusive, of the above section, are out-crops, or are here above drainage level. The Corona Mines seem to be most favorably located for cheap mining, and have been most admirably opened. They consist of only one drift, from which several square miles of territory can be worked. The mouth of the drift, or the coal out-crop, is some twenty feet above Wolf Creek, and as the dip of the coal is here about twenty-five feet to the mile to the southeast or towards the mouth of the drift, the mines have a natural drainage. The shoot on the Ga. P. R. R. is only about 1,200 feet from the mouth of the drift. The ceiling of the main entry is from four to six feet high, and the whole mine seems to be well ventilated. No expensive machinery is required at these mines, but the heavily loaded coal cars are easily pulled down grade, from out of the mines to the shoot, by small mules. These mines were opened in the summer of 1883, and though the out-put for the fiscal year ending July 1, 1886, was only 35,725 tons, from various causes, especially the want of cars, the capacity was readily 400 tons per day. Most of this coal was shipped to New Orleans and the nearer and smaller markets, though a cargo has been recently shipped to each of the following ports, with favorable results, namely: Galveston, West Indies, Aspinwall, and Vera Cruz.

This celebrated Corona Coal is represented by the following analyses of average samples:

	(1)	(2)		(3)
		(a)	(b)	
Specific Gravity.	1.334	1.303	1.359	1.317
Sulphur	0.000	Undet'd	Undet'd	1.953
Moisture, at 110%	1.523	1.633	1.776	1.551
Volatile Matter	31.891	30.940	32.541	37.735
Fixed Carbon	57.244	59.573	55.615	58.811
Ash	9.342	7.854	10.068	1.903
	100.000	100.000	100.000	100.000

No. 1 was a compact laminated coal, with thin bright streaks of very hard coal and thin seams of mineral charcoal. On a fresh surface, the luster was a shiny, tarry black. Some of

this coal resembled *cannel coal*. It was taken 550 feet within from the mouth of the Drift, and represented the whole thickness of the following section, less the slate parting:

(3) COAL; clean, above parting.................. 15 inches.
(2) *Slate;* parting.......... ....3½ inches.
(1) COAL; below slate parting....................26 inches.

The ash was a very delicate grayish pink.

No. 2 represents separately average samples of the coals below and above the slate parting as they occur in the out-crop, or at the mouth of the Drift, and as they are given in (11) of the section above of the strata above and below drainage level, at Corona.

(a) is of a hard compact coal, with bright streaks, and with seams of mineral charcoal, which reached ¼ inch in thickness. It is an analysis of an average sample of the two feet of coal below the slate parting. It had a reddish gray ash.

(b) is of a hard, compact, bony looking coal, of bright and dull streaks and of a *peacock luster*. It is of an average sample of the 14 inches of coal above the slate parting. It had a red ash.

No. 3 represents a vertical section of the whole seam, less the slate parting.

No. 1 was collected by Major W. J. Kelley, and analyzed by the State Geological Survey. No. 2 was collected and analyzed by the Survey, and No. 3 was collected and analyzed by the late Prof. J. L. Campbell, of Washington and Lee University, Virginia.

This same seam of coal crops out in a good many places near these mines, around the foot of *Gaines' peak*. The top of this peak is said to be 680 feet, by actual measurements, above the Gulf of Mexico, and as it is about 300 feet high, the out-crops of the above seam of coal near its base, and the Corona Mines, are about 380 feet above tide water. These high peaks and ridges of this immediate section, of which there are several, are composed principally of hard shales, which, after the large growth has been cut off, often become, on the hill sides, perfectly barren and naked of all vegetation.

Just north of the Ga. P. R. R., and one mile, less two hundred yards, west of the Corona Mines, are the "Wolf Creek Colliery Mines," W. J. Smith, proprietor, in the S. W. ¼ of S. 28, T. 15, R. 9 W. The coal of these mines is of the same seam as the Corona coal, though it is said to be two feet lower, and to be six feet below the bed of Frost Creek, a tributary of Wolf Creek. These mines consist of one slope, which, at the time visited, had just reached the coal. The coal seam at the head of this slope had the following section:

Section of the Coal Seam at Wolf Creek Colliery Mines, in the S. W. ¼ of S. 28, T. 15, R. 9 W.

(6)	*Slate*; good roof.	
(5)	COAL	1 ft. 4½ in.
(4)	*Slate*	3 in.
(3)	COAL	1 ft. 4 in.
(2)	*Slate*	1½ in.
(1)	*Clayey Slate*; underbed.	

The seam of coal where struck by this slope, as seen in the above section, is somewhat below its usual thickness, and lies nearly level, but Mr. W. J. Smith says that borings have shown that, within a short distance of the present heading of his slope, the seam will reach its normal thickness, as at the Corona Mines, and will have a dip of about 25° to the south-east. These mines are at the 69 mile post from Columbus, Mississippi, and are, as yet, the farthest west of any coal mines which are scientifically worked on the Ga. P. R. R., or in Alabama. This seam of coal, (13) of the *General Section*, or the Gaines' bed, Patton bed, etc., seam, though it crops out in many places at the foot of the divide on the north side of Wolf Creek, and though the valley of Wolf Creek is comparatively narrow, it shows in only one or two places on the south side of this creek. One of these places is at the out-crop which is called the *Cooper Mines*, across the narrow valley of Frost Creek from the Wolf Creek Colliery Mines. The Cooper Mines have now been abandoned, and the out-crops of coal at them have all become covered up by debris. In a slope that was commenced at these mines, the hard shale cover has a very strange appearance. This shale is of a yellowish and dark color, and is in long rolls, five and six inches in diameter, which are made up of thin laminæ, in concentric rings, just as the layers of cloth in a roll. For five to six feet within this slope from its mouth, there is a shale of a dull yellow color, with the bundles or rolls lying lengthwise the slope; then, for several feet farther within the slope, there is a similar shale, in similar rolls, but the rolls, instead of lying with the slope, are perpendicular to it or have their ends pointing to the slope from either side; then next, still farther within the slope, for four to five feet, there is a deep black shale which has its rolls lying lengthwise the slope as those at the mouth of the slope, and then, lastly, in the back part of the slope, there is a repetition of the deep black shales, but their rolls are at right-angle to the slope. Some thirty-five feet above the coal out-crop at the Cooper Mines, there is said to be in a ravine an out-cropping of a thin coal seam, but of this we are extremely doubtful.

The divide south of Wolf Creek is over three hundred feet above the creek and near the top of this divide, not far from Ark P. O., or in the S. E. ¼ of S. E. ¼ and N. E. ¼ of N. W. ¼ of S. 33, T. 15, R. 9 W., there are said to be out-croppings of coal from one foot six inches to two feet in thickness. These out-croppings of coal are likely of the same seam as crops out in the Isbell and Crown-over's wells, on the divide on the north side of Wolf Creek, and in Mr. John S. Gaines' well, on the divide on the south side of the creek or in the S. W. ¼ of S. W. ¼ of S. 35, T. 15, R. 9 W. In this last well, the coal is reported to be from one foot six inches to one foot eight inches thick, and is considerably lower than that in the wells on the north side of Wolf Creek, as the top of this well at Mr. John S. Gaines' is only about two hundred feet above Wolf Creek and the coal in it is some twenty feet below the surface.

Some twenty-five feet above the coal in Mr. John S.

Gaines' well, and about one-half mile west of this well, there is an out-cropping of coal in Mr. H. P. Gaines' spring, in the S. W. ¼ of S. E. ¼ of S. 34, T. 15, R. 9 W., which is said to be from two feet three inches to two feet six inches thick. It is probably of the same seam as the coal in Mr. John S. Gaines' well, though it may be of the higher seam, (15) of the *General Section.* The strata hereabouts have a dip of 5° to 6° to the south-east.

About one and one-half miles south of Mr. John S. Gaines', or just over in Fayette county, in S. 10, T. 16, R. 9, W., on Blue Water Creek, near Mr. W. N. Aldrich's, there is the following out-cropping of coal:

Reported Section of a Coal Out-Cropping near Mr. W. N. Aldrich's, on Blue Water Creek, in S. 10, *T.* 16, *R.* 9 *W.*

(4)	*Shale;* clayey.	
(3)	COAL	2 ft. 6 in.
(2)	*Slate*	4 in.
(10)	COAL; reported to have been dug down into, without getting through it	1 ft. 6 in.

Up Blue Water Creek a short distance from the out-cropping of the above section, the same seam of coal shows itself again. It is a bright laminated coal, with thin sheets of mineral charcoal, and has a dip to the south-east. It is likely of the same seam as the coal in the Isbell and Crownover's wells.

Not far from the station or switch where the branch road to the Patton Mines leaves the Ga. P. R. R., or about three-fourths of a mile down the ravine, or south of the Patton Mines, there occurs the following out-crop:

Out-cropping near Patton Mines Switch, or in the N. W. ¼ *of N. W.* ¼ *of S.* 35, *T.* 15, *R.* 8 *W.*

(8)	*Shale.*	
(7)	COAL; thickness undetermined.	
(6)	*Debris, Sandstone*	4 ft. 0 in.
(5)	*Shale;* visible	10 ft. 0 in.
(4)	COAL	1 ft. 9 in.

(3)	*Fire Clay or Clay Slate*	4 in.
(2)	COAL	1½ in.
(1)	*Shale.*	

This out-cropping has a dip of about eight inches in forty feet to the south-east. The upper of these coal out-crops or (7) of the above section, is some twenty to twenty-five feet lower than the coal out-cropping at the mouth of Drift No. 2, of Patton Mines. The coals of this section are doubtless of the same seam as the Patton Mines, Corona, etc., coals, which has thus separated or split up into two parts.

In a ravine just over the divide east of the out-cropping of the last section, or about three quarters of a mile south-east of the Patton Mines, the two coal seams of the above section or the *split* Patton Mines, Corona, etc., coal seam, shows as follows:

Out-Cropping Three-quarters of a Mile South-east of Patton Mines or in the N. E. ¼ of N. E. ¼ of S. 35, T. 15, R. 9 W.

(9)	*Debris.*	
(8)	COAL; undetermined thickness.	
(7)	*Debris;* about	3 ft. 0 in.
(6)	*Sandstone*; about	10 ft. 0 in.
(5)	*Shale;* about	7 ft. 0 in.
(4)	COAL; slaty in places	2 ft. 9 in.
(3)	*Fire Clay* or *Clay Slate*	4½ in.
(2)	COAL	½ in.
(1)	*Fire Clay.*	

The upper coal, (8) of this section, is two to three feet lower than the corresponding coal in the preceding section. About one-quarter of a mile down the ravine, or E S E. of the last out-cropping and some ten feet lower than its lowest coal or (2) of the above section, there is a showing of about fifteen inches of coal smut which is likely of the same coal as (4) of the above section or the *under split* of the Patton Mines' seam of coal. This last coal, it is said, also crops out in an old well about one hundred yards north of this last out-cropping, where it is reported to be about eighteen inches thick. Some six hundred yards south-east of the above fifteen inches of coal smut and some fifteen to twenty feet lower, there is a showing of three to four inches of coal from two to three feet above the level of the track of the Georgia Pacific Railroad. This coal looks as if it might be in a slide. Some five to six feet above it, there is more coal smut. These two out-croppings are likely of the *under split* of the Patton Mines' seam of coal. East of this last coal out-cropping, about one hundred yards and some eighteen feet lower, is the top of a bored hole, in the S. E. ¼ of N. W. ¼ of S. 36, T. 15, R. 9 W., which is said to be ninety feet deep and in which there is said to have been struck no seam of coal of any consequence. Near this bored hole there is an old shaft which was dug previous to the boring of the hole and which must be thirty to forty feet deep. The *under split* of the Patton Mines', etc., coal seam also crops out on a branch in the S. W. ¼ of N. W. ¼ of S. 25, T. 15, R. 9 W., where only about one foot of it shows. At this out-crop, it has a cover of shale of five to six feet in thickness and thin sandstone above. The dip is 4° to 5° to the south-east. On a prong of this same branch about one-quarter of a mile to the south-east of the last out-cropping or in the N. E. ¼ of S. W. ¼ of S. 25, T. 15, R. 9 W., and some fifteen feet higher than the last coal out-cropping, there is the following showing of coal which is doubtless of the *upper split* of the Patton Mines', etc., coal seam:

Coal Out-Cropping,
in N. E. ¼ of S. W. ¼ of S. 25, T. 15, R. 9 W.

(5)	*Debris.*	
(4)	COAL; thickening as gone into	10 in.
(3)	*Slate;* reported	3 in.
(2)	COAL	4 in.
(1)	*Fire Clay.*	

Mr. J. H. Hayes says that his house or Lewiston P. O., which is on top of the divide north of Wolf Creek, or in the S. W. corner of the S. W. ¼ of S. 25, T. 15, R. 9 W., is, by accurate measurements with a surveyor's level, 235 feet above the Georgia Pacific Railroad, opposite to his house, and, that within these 235 feet, there are three seams of coal which crop out respectively two feet, twenty-seven feet and forty-seven feet above the level of the railroad. We believe, however, that Mr. Hayes is mistaken in the number of seams, or that two of the out-crops which he has taken to be of different seams, are of one and the same seam. At Mr. Hayes' house, we believe that the coal seam which occurs in the Isbell and Crownover's wells has been washed away, or that the ridge is not high enough there for it, and that between his house and the level of the Georgia Pacific Railroad, the only coals to be found are the *upper* and *under splits* of the Patton Mines', etc., seam of coal. The *under split* of this Patton Mines', etc. seam of coal shows to a thickness of about eighteen inches on the side of the Georgia Pacific Railroad, a few feet above its track, in the N. W. ¼ of S. E. ¼ of S. 36, T. 15, R. 9 W. In the cuts along the Georgia Pacific Railroad between this last out-cropping and Day's Gap, there are several out-croppings of this *under split.* About four hundred yards south of the last coal out-cropping, or in Wolf Creek in the S. W. ¼ of S. E. ¼ of S. 36, T. 15, R. 9 W., there is an other out-cropping of the above *under split* of coal which is reported to be here eighteen inches thick. It has its usual cover of shale for three to four feet and then a massive, micaceous, carboncaceous sandstone. This sandstone, before weathering, is of a light gray color, and, after weathering, it is of a yellowish orange color. The dip at this last out-crop is 6° to 8° to the south-east. Farther down Wolf Creek, or in a gulch leading down to the creek about three hundred yards south-east of the above coal and out-cropping on the side of the Georgia Pacific Railroad and between twenty and twenty-five feet below it, there is an other out-cropping of this *under split* of coal which shows about seventeen inches of coal. This same *under split* of coal also crops out in the banks of Wolf Creek about three hundred yards S E S. of the last out-cropping and several feet lower. It shows again about three hundred yards further down the creek, or to the north-east of this last out-cropping, where there is some eighteen to twenty feet under it and one to two feet under the water of Wolf Creek, a thin seam of coal which must be of the seam that is four inches thick or (8) of the section by Maj. W. J. Kelley, at Corona. Some fifty steps still farther down the creek, or to the E N E., this same thin coal seam, which is the coal under the *under split* of the Corona, etc., coal seam crops out about six inches above the water, as follows :

Out-cropping on Wolf Creek,
in the S. E. ¼ of S. E. ¼ of S. 31, T. 15, R. 8 W.

(4)	*Sandstones;* carbonaceous, micaceous.	
(3)	COAL; block coal	5 in.
(2)	*Slate*; black	1 in.
(1)	*Fire clay.*	

On the side of a ravine, south-east of Mr. Hayes' about one-half a mile, in the S. W. ¼ of N. W. ¼ of S. 31, T. 15, R. 9 W., there is an out-cropping of the *upper split* of the Patton mines, etc., coal or of (13) of the *General Section*, which is said to be two feet thick and to have a thin parting of slate near the bottom. On a branch north-east from this out-crop, better than one-fourth of a mile, this same coal crops out about as follows :

Out-crop in the N. E. ¼ of N. W. ¼ of S. 31, T. 15, R. 8 W.:

(5)	*Shale;* visible	10 ft. 0 in.
(4)	COAL; about	1 ft. 0 in.
(3)	*Slate*	2½ in.
(2)	COAL.	5 in.
(1)	*Fire clay;* fossiliferous.	

Down the branch, or south about one-fourth of a mile from this last out-cropping and between 25 and 30 feet lower, there crops out, in the S. E. ¼ of N. W. ¼ of S. 31, T. 15, R. 8 W., the *under split* of the coal (13) of the *General Section*, about as follows :

Coal Out-crop, in S. E. ¼ of N. W. ¼ of S. 31, *T.* 15, *R.* 8 *W.*

(6)	*Sandstone*; visible	5 ft. 0 in.
(5)	*Shale*	5 ft. 0 in.
(4)	COAL; shaly on top	1 ft. 9 in.
(3)	*Slate*	½ in.
(2)	COAL	2 in.
(1)	*Fire clay.*	

In *Coal Valley* on Cane Creek, or in sections 19 and 20, T. 15, R. 8 W., this seam, (13) of the *General Section*, is all together as at Corona, Patton mines, etc., hence the split takes place in it south of a line running directly from Corona to Coal Valley. On the side of the road and ridge just west of Cane Creek and Coal Valley, or in the S. W. ¼ of N. E. ¼ of S. 19, T. 15, R. 8 W., there is an out-cropping of this thick seam of coal, some 35 feet above low water in Cane Creek, which had been drifted into, but, at the time visited, the cover had caved in and hid the coal out-crop completely. On the out-cropping of this same thick seam of coal around Coal Valley, in sections 19 and 20, T. 15, R. 8 W., the "Alabama and Virginia Mining and Manufacturing Company" have driven seven drifts, of which four are on the north side of the valley or Cane Creek and three are on the south side. These drifts are all in the same seam of coal, (13) of the *General Section*, which, as already stated, is here, as at Corona, Patton mines, etc., all together, but which can, in these drifts, be seen to gradually split along the *clay parting* and the parts to become gradually wider and wider separated as you go to the south-east. As will be seen from sections that will be given, this *clay parting* does not exist at all in *Drift No.* 7 of Coal Valley, but in *Drift No.* 4, which is about one-fourth of a mile north-east of No. 7, it is one inch thick, while in *Drift No.* 3, which is about one-fourth of a mile east of No. 4, it is 10 inches thick, and in *Drift No.* 2, which is some 700 yards S E S. of No. 4, it is one foot two inches thick, and at Day's Gap, which is about one and three-fourths miles south-east of *Drift No* 4, the parts of the seam above and below the *clay parting* are about seven feet apart. This seam of coal, as it occurs in *Drift No*, 7, which is in the S. E. corner of the S. W. ¼ of N. E. ¼ of S. 19, T. 15, R. 8 W., is represented by the following sections:

Sections of Coal Seam in Drift No. 7, of Coal Valley, in the S. W. ¼ of N. E. ¼ of S. 19, T. 15, R. 8 W.

		(1)	(2)	(3)	(4)
(7)	*Shale;* roof.				
(6)	COAL....	1 ft. 0 in.	1 ft. 1 in.	1 ft. 0 in.	1 ft. 1 in.
(5)	*Slate*.....	3½ in.	2 in.	2¾ in.	2½ in.
(4)	COAL....	3 ft. 0 in.	2 ft. 8 in.	2 ft 9¾ in.	2 ft. 8½ in.
(3)	*Fire clay*.	1 ft. 6 in.		1 ft. 11 in.	1 ft. 8 in.
(2)	COAL ...	1½ in.		1½ in.	2 in.
(1)	*Slate.*				

Section (1) is of the out-crop at the mouth of Drift No. 7; the other sections, (2), (3) and (4), are of the coal seam at different points within Drift No. 7. This is the only one of the drifts of Coal Valley which is now being worked. Its main entry runs N. 72° W. and crosses a wave in the strata, which is about three feet deep from top of crest to bottom of trough, and its half length is about 130 feet. Just over the trough of this wave and running along with it, there is a fissure or break in the strata without any displacement of the strata. This fissure or gap in the strata, in the roof, is from four to six inches wide. These mines are connected by a branch railroad, about two miles long, with the Georgia Pacific Railroad at Day's Gap. The first coal was shipped from these mines on April 15, 1885, and, up to July 1, 1885, there had been shipped an average of eighty tons of coal per day. The out-put during the year 1886, it is thought, will be about 200 tons of coal per day. This coal is sold principally in Memphis, New Orleans, Mobile and Atlanta.

This seam of coal, in its out-crops at the mouths of drifts Nos. (4), (3) and (2), has respectively the following sections:

Sections of the Coal Valley's Seam of Coal, in S's 19 and 20, T. 15, R. 8 W.

		(1)	(2)	(3)
(9)	*Shale;* hard, roof.			
(8)	COAL	1 ft. 2 in.	1 ft. 3 in.	1 ft. 1 in.
(7)	*Slate*	1½ in.	2 in.	2 in.
(6)	COAL	1 ft. 5 in.	8 in.	1 ft. 4 in.
(5)	*Clay slate* or *fire clay;* parting	1 in.	10 in.	1 ft. 2 in.
(4)	COAL	1 ft. 4 in.	1 ft. 3 in.	1 ft. 3 in.
(3)	*Slate*; clayey	2 ft. 2 in.	2 ft. 6 in	2 ft. 0 in.
(2)	COAL	1½ in.	4 in.	2 in.
(1)	*Slate.*			

Section (1) is the coal out-crop at the mouth of Drift No. (4), which is in the N. E. ¼ of S. E. ¼ of S. 19, T. 15, R. 8 W., and is about thirty-five feet above low water in Cane Creek. In (6) of this section there is a streak, about two inches thick, of *semi-cannel coal*, and in (3) there is a row of balls of *clay iron stone.* An average sample, which represents a vertical section of this coal out-crop, less the partings, gave, on analysis, the following results:

Specific Gravity	1.320
Moisture	1.319%
Volatile Matter	32.674%
Fixed Carbon	56.598%
Ash	9.409%
	100.000

Section (2) is of the coal out-crop at the mouth of Drift No. 3, which is in the N. E ¼ of S. W. ¼ of S. 20, T. 15, R. 8 W. (6) of this section is also a *semi-cannel coal.* A slight fault is said to have been encountered in this drift.

Section (3) is of the coal out-crop at the mouth of Drift No. 2, which is in the S. E. ¼ of S. W. ¼ of S. 20, T. 15, R. 8 W. (6) of this section also resembles *cannel coal.* At the mouth of this drift, there was seen a pile of coal after it had been lying out in the weather for more than twelve months, and but very few of the lumps had crumbled.

The seam of coal at Coal Valley is said to dip 3½ feet to the 1,000 feet to the south-east. In a well at Coal Valley, in the N. E. ¼ of S. E. ¼ of S. 19, T. 15, R. 8 W., the next underlying coal, four inches thick, is said to have been gone through.

Between Coal Valley and Day's Gap, there is to be seen along the bed of a branch where once the Crabb road ran, regular folds or waves in the rocks, which are cracked or split open along the crests of these waves. These waves run from W N W. to E S E. The rocks are thin shaly micaceous sandstones, and are full of coal plant impressions. Day's Gap is the present eastern terminus of the Western Division of the Ga. P. R. R.

The following is an approximate section of the strata above drainage level at Day's Gap :

Approximate Section of the Strata above Drainage Level at Day's Gap, in the S. E. ¼ of S. E. ¼ of S. 29, T. 15, R. 8 W.

(10)	*Measures*; about		100 ft. 0 in.
(9)	COAL; reported, doubtful		6 in.
(8)	*Debris*; about		20 ft. 0 in.
(8)	*Shales*; about		10 ft. 0 in.
(7)	COAL; with streak of Mother of Coal	Upper Split.	1 ft. 0 in.
	Slate; hard		½ in.
	COAL		1½ in.
	Slate		1½ in.
	COAL		1 ft. 3 in.
(6)	*Shale*; parting		7 ft. 0 in.
(5)	COAL; under split		1 ft. 8 in.
(4)	*Debris*; about		20 ft. 0 in.
(3)	COAL		8 in.
(2)	*Shale*; curly, about		10 ft. 0 in.
(1)	COAL; in Cane Creek, (11) of the *General Section*, reported		1 ft. 7 in.

Nos. (7) and (5) of this section are respectively the *upper* and *under splits* of the Coal Valley seam. The *Day's Gap Coal Company* first opened the coal (7) on the east side of the Gap, where, on the out-crop, it had a thickness of two feet ten inches, and, eighty feet within, a thickness of two feet eight inches, when a fault and *down-throw* was struck, and the drift was abandoned. This fault and down-throw is not believed to be very great. It may not be more than a few feet, though it has never been tested. After abandoning this drift, the same company drifted in on the out-crop of the *under split* of the same seam of coal, (5) of the above section, on the west side of the Gap, where it was twenty inches thick. After following this under split up for forty to fifty yards, it in turn was abandoned in favor of the old seam or *upper split*, (7) of the above section, which was reached from this *under split*, or with the main entry on this *under split*, on the west side of the Gap, by means of a steep grade. This *upper split* of the Coal Valley, Corona, etc., seam has at two different points in these mines, on the west side of Day's Gap, and in a test hole on the west side of the Gap, the following sections:

Sections of Coal Seam in Day's Gap Mines, and in a Test Ho'e on the West Side of the Gap, in the S. E. ¼ of S. E. ¼ of S. 29, T. 15, R. 8 W.

		(1)	(2)	(3)
(7)	*Shale.*			
(6)	COAL	1 ft. 0 in.	8½ in.	1 ft. 8 in.
(5)	*Slate*	½ in.	1 in.	1½ in.
(4)	COAL	1½ in.	2¼ in.	1 ft. 11 in.
(3)	*Slate*	1½ in.	1 in.	
(2)	COAL	1 ft. 3 in.	1 ft. 4 in.	
(1)	*Slate.*			

Sections (1) *and* (2) are of the coal seam in the present mines, and (3) is of it in a test hole on the west side of the Gap, about two hundred yards south of the mouth of the new drift or present mines. The main entry of this new drift runs in a south-west direction and seemingly along the crest of a long flat wave, as the coal seam on either side appears to dip away from the entry. The *under split* of the Coal Valley, Corona, etc., coal seam also shows in a test hole, about one hundred and twenty yards south of the mouth of the new drift. In this test hole, it measures about one foot seven inches in thickness, and is covered by a massive sandstone with a scaly surface. It also shows higher up in the Gap, in the bed of the branch which runs through the Gap, about one-fourth of a mile from its mouth or from where it runs into Cane Creek, at the mouth of the Gap. In this last out-cropping, it is from twenty to twenty-one inches thick, though it has in it two thin streaks of slate which are respectively two and four inches from the top. The dip is to the south-east. Between the last two mentioned coal out-crops, which are of the *under split* of the Coal Valley seam, there is to be seen along the railroad the coal smut of the *upper split* of the same seam, or of (7) of the above section. The lowest of the coal out-crops here at Day's Gap, the one in Cane Creek, (1) of the above section, or the thick slaty seam (11) of the *General Section*, must thin out and split up west of Day's Gap, as shown by the lower part of Major Kelley's section at Corona. Still higher up the Gap, or south of the out-crop of the *under split* of Coal Valley coal, there is to be seen along the railroad and the dirt road several out-croppings of coal smut of the *upper split*. Under a trestle of the Ga. P. R. R., about one and one-half miles from Day's Gap, or in the N. E. ¼ of S. W. ¼ of S. 32, T. 15, R. 8 W., there is on the side of the ravine an out-cropping of the *upper split* of Coal Valley coal, which appears to be in a slide. Some twenty feet below this last out-cropping of coal, and about two hundred yards up the ravine from the trestle, there crops out in the bed of the branch the next coal underlying the Coal Valley coal. This out-crop is about eight inches thick, and is a block coal, or is cut up by parallel seams, about two inches apart, which run north-east and south-west. Down the railroad, or west from the above trestle about three hundred yards, there is in a hole that has been washed out at a culvert, in the N. E. ¼ of S. W. ¼ of S. 32, T. 15, R. 8 W., the following out-crop of the *under split* of the Coal Valley coal:

Out-Cropping on the side of the Georgia Pacific Railroad, in the N. E. ¼ of S. W. ¼ of S. 32, T. 15, R. 8 W.

(5)	*Measures.*	
(4)	*Shale;* visible	3 ft. 0 in.
(3)	COAL; good and hard	1 ft. 6 in.
(2)	*Slate;* soft and clayey	¼ in.
(1)	COAL	1 in.

This out-cropping has a dip to the south-east, but as it is about twenty-five feet above Wolf Creek, it seems to be getting higher and higher above drainage level as we trace it to the east or south-east, or the dip to the east or south-east is less than the fall of Wolf Creek. In a road on the side of the ridge about twenty-five feet above this last coal out-cropping, there is to be seen the smut from the *upper split* of the Coal Valley coal. Down the Railroad or to the W N W. about one-half of a mile from the last out-cropping, there is an other showing of this *under split* of coal in the Railroad cut and also, in a road, the smut of the *upper split* of the Corona, etc., seam of coal.

An out-cropping of coal occurs in Wolf Creek in the N. E. ¼ & S. E. ¼ of N. E. ¼ of S. 6, and N. W. ¼ & S. W. ¼ of N. W. ¼ of S. 5, T. 16, R. 9 W., which is said to be several feet thick, but which is divided up by partings of slate. It doubtless corresponds to the seam of coal in Cane Creek at Days' Gap or to (11) of the *General Section.* Its cover for four to five feet is a hard shale and then a carbonaceous sandstone. It dips to the south-east. On a branch in the N. W. ¼ of N. W. ¼ of S. 4, T. 16, R. 8 W., there is an out-cropping of bony coal which is about twelve inches thick. This same coal also crops out on an other branch, about two hundred and twenty-five yards to the south, where it shows a thickness of about ten inches. The dip of the coal at these out-crops seems to be nearly one foot to the one-hundred feet to the south-east and, unless there is a fault between these out-crops and Day's Gap, it corresponds closely to the horizontal position of the *under split* of the Coal Valley coal. More than one hundred feet above the seam of the last two coal out-crops, there is on the side of the high ridge just south of Wolf Creek at the bridge, or in the N. W. ¼ of N. E. ¼ of S. 8, T. 16, R. 8 W., an out-cropping of coal at a chalybeate spring which, it is said, never goes dry. This spring rises just under a bluff of massive sandstone. Some forty feet higher up on the side of this ridge than the above spring or coal out-cropping, there is, in the bed of a dry branch, an out-cropping of an other seam, in which the coal was visible down to a thickness of about twelve inches. These last two coal out-crops are probably (14) and (15) of the *General Section.*

The following, we believe, is an approximate section of the coal out-crops hereabouts or near Rising Sun, P. O.:

Approximate Section of Coal Out-Crops near Rising Sun, P. O., or in the N. W. Part of T. 16, R. 8 W.

	Measures; say	100 ft. 0 in.
(6)	Coal; thickness undetermined, visible	1 ft. 0 in.
	Measures; about	50 ft. 0 in.
(5)	Coal; thickness undetermined.	
	Measures; about	60 ft. 0 in.
(4)	Coal; reported	6 in.
	Measures; about	30 ft. 0 in.
(3)	Coal; *upper split* of Coal Valley coal, about	2 ft. 6 in.
	Measures; about	25 ft. 0 in.
(2)	Coal; *under split* of Coal Valley coal, about	1 ft. 8 in.
	Measures; about	30 ft. 0 in.
(1)	Coal; in Wolf Creek, from	1 ft. to 3 ft. 0 in.

In the banks of Wolf Creek in the N. W. ¼ of S. E. ¼ of S. 10, T. 16, R. 8 W., there is the following out-crop:

Out-Cropping on Wolf Creek, in the N. W. ¼ of S. E. ¼ of S. 10 T. 16, R. 8 W.

(4)	*Sandstones*; carbonaceous and micaceous, fossiliferous and of a gray color	4 ft. 0 in.
(3)	*Slate*; black and bituminous, it might become a *bony coal*	4 ft. 0 in.
(2)	Coal; about	1 ft. 0 in.
(1)	*Slate*; bluish, to water level	4 in.

This coal out-crop, we believe, corresponds to (1) of the above approximate section. It also shows in the banks of the creek about fifty yards higher up stream or east of the last out-cropping. Its dip seems to be 8° to 10° to the south-east. About one-quarter of a mile farther down the creek or south-east of the out-cropping of the above section, there is a bluff from seventy-five to eighty feet high of hard shales which very much resemble the shales composing the high peaks near Lewiston P. O. and Corona, and doubtless they are the same. In a well, on the side of a hill, about six hundred yards east of the out-cropping of the last section on Wolf Creek or at the Shepherd old place, in the N. E. ¼ of N. E. ¼ of S. 10, T. 16, R. 8 W., there is said to be a seam of coal 18 inches thick, from twenty to twenty-five feet below the surface, which would make it about twenty-five feet higher than the above coal in Wolf Creek or about bring it to coincide with the *under split* of the Coal Valley coal. Coal smut is also said to have once showed in a little gully near this well and not far from a level with the top of the well. It was doubtless of the *upper split* of the Coal Valley coal. On the side of the hill north of this well and some thirty feet or more above the top of the well, there is also said to be an out-cropping of coal from six to eight inches thick. It would correspond to (4) of the above section near Rising Sun P. O. On the side of a branch about two hundred and fifty yards W N W. of the above well, there is an everlasting chalybeate spring which doubtless has its origin in the out-crop of the same seam of coal as occurs in the well. On an other branch in the north-east corner of S. 10, T. 16, R. 8 W., there is an out-cropping of coal which is reported to be from ten to twelve inches thick and which is doubtless also of the same seam as that in the above well. This same seam of coal also doutless crops out at and gives rise to the well known *Sulphur Spring*, as it is called, in the N. E. ¼ of N. W. ¼ of S. 4, T. 16, R. 8 W. Over the sections of country which are formed by or have for surface strata, thick beds of hard shale like those over the Corona coal, etc., as is the case with the general level of the country around Rising Sun P. O., good lasting drinking water of either wells or springs becomes frequently very scarce during the drouthy summer months, hence when such a lasting spring as the above *Sulphur Spring* occurs in such a locality, it is well known in the neighborhood.

On the south or west side of Cane Creek, about one-half of a mile below Cobb's Mill, or in S. 33, T. 15, R. 8 W., there is said to be an out-cropping of coal which is much thicker than those at Day's Gap. Mr W. B. Day says that near the center of S. 28, T. 15, R. 8 W., there are the out-crops of three seams of coals. The lowest one, he says, crops out in Cane Creek and is some three feet thick, the next one is some fifty feet higher and the third and upper one is still fifty feet higher. These three coal seams are doubtless the same as those which crop out at Day's Gap or of the *upper* and *under splits* of the Coal Valley coal and of the seam in Cane Creek at the mouth of Day's Gap or (11) of the *General Section.*

In the N. E. ¼ of N. E. ¼ of S. 34, T. 15, R. 8 W., there is reported to be an-out-cropping of coal some thirty-five feet above Cane Creek. Not far from Mr. J. R. Sardin's, in the N. W. ¼ of S. W. ¼ of S. 27, T. 15, R. 8 W., there is an out-cropping of coal some forty feet above Cane Creek; it is doubtless of the same seam as that which is being mined by the *Day's Gap Coal Company* or (11) of the *General Section.* In this neighborhood, this seam of coal is said to crop out near the tops of all the higher hills and ridges, getting higher and higher above Cane Creek as you go down the creek or eastward.

Section of a Coal Out-Crop at Cobb's Spring, in the S. E. ¼ of S. 27, T. 15, R. 8 W.

(6)	*Debris;* loose massive rocks, etc.	
(5)	*Black Smut;* out-crop of *coal*	5 in.
(4)	*Clay*	1 ft. 0 in.
(3)	BLACK SMUT; out-crop of *coal*	4 in.
(2)	*Slate*; clayey, about	5 ft. 0 in.
(1)	COAL; in spring. This coal is said to have been dug down into, without getting through it, at the least	2 feet 4 in.

This coal is probably of (13) of the *General Section*, though it may be of the lower seam (11) of the *General Section*. In S. 9, T. 15, R. 8 W., the coal of the following section crops out high up on a ridge.

Approximate Section in S. 9, T. 15, R. 8 W.

(4)	*Shale, Sandstone, Debris;* to top of ridge	100 ft. 0 in.
(3)	COAL; out-crop about	1 ft. 6 in.
(2)	*Fire Clay*	1 ft. 2 in.
(1)	*Shale, Sandstones, Debris;* to the bottom of the ravine, about	100 ft. 0 in.

This coal is thought to be of (13) of the *General Section*; it dips to the S S E. In the shale, about ten feet below the coal, there is a seam, about one and a half inches thick, of *cellular clay iron stone*, in which the cells are filled with an ashy gray sand containing much *pyrites*. In the wells, in the N. W. ¼ and S. W. ¼ of S. 10, T. 15, R. 8 W., there is said to be a seam of coal about two inches thick. In S. 19, T. 15, R. 7 W., near Mr. Carmichael's and not far from Odum's Mill, on Lost Creek, there are the following badly exposed out-crops of coal:

Section near Mr. Carmichael's, in the Southern Part of S. 19, T. 15, R. 7 W.

(8)	*Debris*; loose rock, etc	100 ft. 0 in.
(7)	*Slate*; compact and hard, forming massive rocks and low cliffs with small rock-houses. Showing	6 ft. 0 in.
(6)	*Debris;* slide	14 ft. 0 in.
(5)	COAL; showing	1 ft. 6 in.
(4)	*Shale, Debris*	10 ft. 0 in.
(3)	COAL; seemingly in a slide	6 in.
(2)	*Debris*	3 ft. 0 in.
(1)	*Sandstones, Shale, Debris;* to foot of ridge	30 ft 0 in.

The coal (5) of the above section is seemingly the *under split* of Corona, etc., coal. The rocks of this section dip towards the south.

Just over the ridge or divide, from these last coal outcroppings, at a spring in the N. W. ¼ of S. 30, T. 15, R. 7 W., there is the *Currington coal bed*. At this bed the coal extends down as far as could be seen. It showed to a thickness of about three feet and it is said to be three feet and eleven inches thick. It has a yellowish gray shale cover and is doubtless of the same seam of coal as one or the other of the coals in the above section. At Mr. Somer's spring, in the N. E. ¼ of N. E. ¼ of S. 25, T. 15, R. 8 W., about one-fourth of a mile distant from the Currington bed and seemingly some ten to fifteen feet higher, there is an other out-cropping of coal which has the following section :

Section of Coal Out-cropping at Mr. Somer's Spring, in the N. E ¼ of N. E. ¼ of S. 25, T. 15, R. 8 W.

(5)	*Shale;* yellowish.	
(4)	COAL ; out-crop	4 in.
(3)	*Clay*	1 ft. 2 in.
(2)	COAL	3 in.
(1)	*Slate;* soft and clayey, showing	4 in.

These coal out-croppings of the Currington and Somer's coal beds are believed to be respectively the *lower* and *upper splits* of the coal (13) of the *General Section* or of the upper and lower parts of the seam that crops out in Coal Valley. They may both be of the *upper split.* A seam of coal four inches thick occurs in the bottom of Mr. J. M. Tubb's well, in the S. E. ¼ of N. W. ¼ of S. 25, T. 15, R. 8 W., with an underbed and cover of slate. In the S. E. ¼ of N. E. ¼ of S. 25, T. 15, R. 8 W., there is a two inch out-cropping of coal with slate above and below; it is considerably lower than that at Mr. Somer's spring, and must be either of (11) or (12) of the *General Section.* An out-cropping of coal in the S. E. ¼ of N. E. ¼ of S. 26, T. 15, R. 8 W., is said to show a thickness of three to four feet, and one in the S. W. ¼ of S. W. ¼ of S. 26, T. 15, R. 8 W. is nine inches thick. On the side of the ridge, south of Cane Creek, in the N. W. ¼ of S. 36, T. 15, R. 8 W., some thirty feet above the creek and twenty feet below the level of Day's Gap, as is reported to have been stated by railroad engineers, there is said to be an out-cropping of coal about four feet in thickness. It is of about the same height above Cane Creek as the out-cropping at Somer's spring, and is doubtless of the same seam of coal as the Somer's or Currington beds, or is of the *upper* or *under splits* of (13) of the *General Section.* It is believed to be of the *upper split* of (13) of the *General Section.* By the side of the Tuscaloosa and Jasper road, in the S. E. ¼ of S. E. ¼ of S. 35, T. 15, R. 8 W., near the ford of Cane Creek, there shows an out-cropping of a seam of coal, as follows :

Section in the S. E. ¼ of S. E. ¼ of S. 35, T. 15, R. 8 W.

(3) *Shales, Sandstones;* sandstones in seams in the shale. They form a bluff .... 10 ft. 0 in.
(2) Coal; in back part of small rock-house . .... 1 ft. 0 in.
(1) *Clay, Slate;* soft.

These rocks in this out-crop dip away from the creek or to the north-west. A hundred or so yards from this locality, on the banks of Cane Creek, in the N. E. ¼ of N. E. ¼ of S. 2, T. 16, R. 8 W., there is the following out-crop :

Section on Cane Creek,
in N. E. ¼ of N. E. ¼ of. S. 2, T. 16, R. 8 W.

(7) *Debris.*
(6) *Shale, Sandstone;* slate with seams of sandstone, forming a bluff........... ....10 ft. 0 in.
(5) *Debris*........ ... .15 ft. 0 in.
(4) Coal...... . ... .10 in.
(3) *Clay, Slate* or *Fire Clay* .... 4 ft. 0 in.
(2) *Debris*..... .... 10 ft. 0 in.
(1) Coal; so reported, in bed of Cane Creek, (Hutto's coal bed). Said to have been gone down into, without getting through it, at the least .... 1 ft. 6 in.

Coal (4) of this section is the same as coal (2) of the preceding section. (5), (4), and (3) of this last section look as if they might be in a slide. These coals are doubtless under the seam of the Currington bed and the out-crop at Somer's spring. They are probably (12) and (11) of the *General Section.*

Near the Fork of Lost and Cane creeks, there are many out-crops of the coals of the following section :

Approximate Section of the Measures above Drainage Level at the Fork of Lost and Cane Creeks.

(14) *Shale;* showing.............................10 ft. 0 in.

(12) *Sandstone;* soft gray micaceous sandstone, with thin sheets of *mineral coal* and *charcoal.* Thin.

(11) Coal; *under split* of (13) of the *General Section;* thickness not known; it must be over .... 1 ft. 6 in.

(10) *Shale, Sandstone*..........................30 ft. 0 in.

(9) Coal; *under split* of (13) of the *General Section*. 3 ft. 6 in.

(8) *Shale, Sandstone, Debris;* about.........70 ft. 0 fn.

(7) *Sandstone;* slaty and curled, with thin sheets of *Coal.* Surface covered with much copperas................ 6 in.

(6) Coal; (12) of the *General Section*.....from 1½ in. to 5 in.

(5) *Slate;* bluish .... 3 ft. 6 in.

(4) *Sandstones;* hard, slabby and shaly, fossiliferous, and dove colored...................................10 ft. 0 in.

(3) *Slate.*

(2) Coal; (11) of the *General Section;* bony, with bright and dull streaks. Thickness unknown, though not less than 1 ft. 6 in. Crops out in Lost and Cane creeks ....1 ft. 6 in.

(1) *Slate;* thin.

In a well on the side of the old Baltimore road, in the N. E. ¼ of S. W. ¼ of S. 32, T. 15, R. 7 W., the coal (11) of the above section was struck about ten feet below the surface. It also crops out in the road, but a few steps N N W. of the well, and only a few feet below the level of the top of the well; hence its dip here is decided and is to the S S E. West of north from the above well, some two hundred yards, in a branch in the S. W. ¼ of N. W. ¼ of S. 32, T. 15, R. 7 W., there is an out-cropping of the coal (9) of the above section. Only about one foot of the thickness of the seam is here visible. It also crops out in the old Baltimore road, in the same forty acres, and in the S. W. ¼ of N. E. ¼ of S. 32, T. 15, R. 7 W., and in the N. W. ¼ of S. 5, T. 16, R. 7 W., and in several places along the settlement road on the west bank of Lost Creek, below Williams' Mill. Coal (6) crops out under a bluff just opposite to Williams' Mill, and coal (2) occurs in Lost Creek just below the mill, or in the S. W. ¼ of N. W. ¼ of S. 32, T. 15, R. 7 W. This last coal, here in Lost Creek, projects only about one foot above low water, but it is said to occur in the bottom of the holes, four and five feet deep, in the creek. The portion above water is a good hard bony coal with bright and dull streaks. In Lost Creek, at the mouth of Rocky Branch, in the N. W. ¼ of S. W. ¼ of S. 32, T. 15, R. 7 W., this seam of coal is said to have been dug down into about three feet. In Lost Creek, in the S. W. ¼ of S. W. ¼ of S. 32, T. 15, R. 7 W., it crops out, and the coal (9) crops out on the side of the road away above it. In Cane Creek, there are outcrops of coal in S's 34, 35, and 36 of T. 15, R. 8 W., and in S. 31, T. 15, R. 7 W., and in S's 6 and 5 of T. 16, R. 7 W. These coal out-crops in Cane Creek are doubtless principally, if not altogether, of the coal (2) of the section above, or (11) of the *General Section.* The top of the coal outcrop in Cane Creek in the N. E ¼ of N. E. ¼ of S. 6, T. 16, R. 7 W., is a few inches above low water level. This coal is like the coal that crops out in Lost Creek, just below Williams' Mill, and is doubtless of the same seam. It is a hard bony coal of brighter and duller streaks, and would make an excellent stocking coal. It is laminated and clean and breaks into regular fragments. The following analysis is given by the State Geologist in his report for 1879–80. It is of specimens from this coal out-cropping, or from the upper part of the coal seam that crops out in Cane Creek, in S's 5 and 6, T. 16, R. 7 W.:

Specific gravity	1.310
Sulphur	.728
Moisture	2.261
Volatile Matter	33.782
Fixed Carbon	57.002
Ash	6.955
	100 000

Coal is also said to occur in Lost Creek, below the mouth of Cane Creek, in the the N. E. ¼ of S. E. ¼ of S. 4, T. 16, R. 7 W., near the mouth of *Reese's branch.*

Near Zion church, in the S. W. ¼ of N. E. ¼ of S. 15, T. 15, R. 7 W., there is an out-cropping of coal, from seven to eight inches thick, with an underbed of clay and a cover of shaly, micaceous, fossiliferous sandstone. It may be (10) of the *General Section.*

On the head waters of Baker's Creek, there are numerous out-croppings of three or more seams of coal.

Approximate Section of the Measures on the Head-Waters of Baker's Creek.

(1) ***Measures;*** with, as reported, one seam of *coal*, from	75 ft. to 100 ft. 0 in.
(5) COAL; under-split of (13) of the *General Section*, reported	2 ft. 0 in.
(4) ***Measures;*** about	30 ft. 0 in.
(3) COAL; (12) of the *General Section*	6 in.
(2) ***Measures***	45 ft. 0 in.
(1) COAL; (11) of the *General Section*, about	4 ft. 0 in.

In the Jonesboro road, just north of Mr. P. P. Jones, in the S. E. ¼ of S. W. ¼ of S. 23, T. 15, R. 7 W., there is an out-cropping of coal, with about two feet in thickness of coal smut visible, and, in the same road, just south of Mr. Jones, and some forty-five feet higher than the out-crop just mentioned, there is a six-inch out-cropping of coal. The first of these coals, which is (11) of the *General Section*, also crops out at Mr. P. P. Jones' spring, and again about fifty yards west of the spring, just over the low divide in the fork of two small branches. The coal at these two out-crops has about the following section :

Section of Coal Out-crops at and near Mr. P. P. Jones' Spring, in the S. E. ¼ of the S. W. ¼ of S. 23, T. 15, R. 7 W.

(8) ***Sandstones;*** massive	10 ft. 0 in.
(7) ***Sandstones;*** shaly and slabby, and of a yellowish gray color	15 ft. 0 in.
(6) ***Shale;*** sandy and of a yellowish color	10 ft. 0 in.
(5) COAL; very good at the spring but in other out-crop it is badly weathered, slaty	1 ft. 6 in.
(4) ***Slate***	1½ in.
(3) COAL; good, a little slaty	1 ft. 2½ in.
(2) ***Slate;*** clayey and bluish in most western out-crop, black at the spring	3 in.
(1) COAL; good, hard and bright	1 ft. 3 ½ in.

This coal is (1) of the preceding section on the head waters of Baker's Creek, or (11) of the *General Section.* Some three-fourths of a mile west of these coal out-crops, just over a high divide, this same seam of coal is said to make its appearance and to be four feet in thickness. In the S. E. ¼ of the N. W. ¼ of S. 24, T. 15, R. 7 W., at the foot of the "*Big Ridge*," a coal out-crop shows about one foot in thickness, and, considerably lower than this out-crop, in the S. E. ¼ of the S. E. ¼ of S. 14, T. 15, R. 7 W., there is an out-crop from which the neighborhood blacksmiths have been raising coal. These coals are probably (11) and (12) of the *General Section.* In a branch, in the S. E. ¼ of the S. E. ¼ of S. 24, T. 15, R. 7 W., there is an out-cropping which shows only two inches of coal, though the seam is said to be about two feet six inches thick, and some fifty feet above it, in the road, is an other thin out-cropping of coal. These coals are also likely (11) and (12) of the *General Section.* Coal is also said to occur at a spring, high up on a ridge, in the S. W. ¼ of the N. W. ¼ of S. 25, T. 15, R. 7 W.

Approximate Section along Helm Prong of Baker's Creek, from the Lennard's Coal Bed, in the S. ½ of N. W. ¼ of S. 26, T. 16, R. 7 W., to the Bradley Coal Bed, in the S. W. ¼ of S. W. ¼ of S. 26, T. 15, R. 7 W.

(5) *Shale;* clayey and of a yellowish color, and showing about	10 ft. 0 in.
(4) COAL; Lennard's coal bed, under split of (13), *General Section*	2 ft. 4 in.
(3) *Slate*; bluish	3 ft. 0 in.
(2) *Slate, Sandstones, Debris*; about	60 ft. 0 in.
(1) COAL; Tom Bradley's coal bed, (11) of the *General Section*, said to be	4 ft. 0 in.

The *Lennard bed* is at one of the head springs of Helm Prong. The Tom Bradley coal bed, at the time visited, was covered by water. The strata of the above section appear to dip to the north-east. The following analysis is of a hard, lustrous coal, free from smut, from the *Bradley coal bed:*

Specific gravity	1.278
Sulphur	6.90
Moisture	2.702
Volatile matter	29.564
Fixed carbon	64.818
Ash	2.916
	100.000

In a well, on a very high point, in the S. E. ¼ of S. W. ¼ of S. 27, T. 15, R. 7 W., there is said to be a seam of coal two or more feet in thickness. In the S. W. ¼ of S. E. ¼ of S. 28, T. 15, R. 7 W., there is an out-cropping of coal, and some twenty-five to thirty feet above it, at a spring, in the S. E. ¼ of S. E. ¼ of S. 28, T. 15, R. 7 W., there is about eleven inches of coal visible.

Section of Widow Bailey's Coal Bed,
in the S. E. ¼ of S. E. ¼ of S. 28, T. 15, R. 7 W.

(7)	*Sandstones*; slabby.	
(6)	*Shale*; sandy and yellow, showing	10 ft. 0 in.
(5)	COAL; shaly and much weathered	1 ft. 8 in.
(4)	*Slate or Slaty Coal*	2 in.
(3)	COAL; good, though much weathered	1 ft. 5 in.
(2)	*Slate;* bluish	2 ft. 0 in.
(1)	*Sandstone*; slabby.	

This coal, at the point examined, had a dip of four to five feet in thirty yards to the south-west; it was doubtless in waves. It is of the same seam as the *Jones*, *Bradley*, *etc. beds*, or (11) of the *General Section*, though the under portion of it, as exposed in the *Jones bed*, is here wanting. This under portion doubtless has split off from the rest of the seam and at the out-cropping of the above section is below the surface. The State Geologist, in his report for 1879–80, gives the following as a section of this seam of coal at an out-cropping on Mrs. Bailey's land, in the S. E. ¼ of S. E. ¼ of S. 20, T. 15, R. 7 W.:

Section of Mrs. Bailey's Bed, in the S. E. ¼ of S. E. ¼ of S. 20, T. 15, R. 7 W.

(9)	*Massive Sandstone*	6 ft. 0 in.
(8)	*Slaty roof*	8 ft. 0 in.
(7)	COAL; good	1 ft 6 in.
(6)	*Black Shale*	1½ in.
(5)	COAL; bony	9 in.
(4)	*Parting*	¼ in.
(3)	COAL; good	3 in.
(2)	COAL; bony	4¼ in.
(1)	*Slate.*	

The subjoined analyses are also given in the above report of the coal from this out-cropping:

	(1)	(2)
Specific Gravity	1.339	1.416
Sulphur	.603	1.236
Moisture	5.715	1.533
Volatile Matter	28.095	30.405
Fixed Carbon	62.612	51.962
Ash	3.578	16.100
	100.000	100.000

No. 1. The better part, but dull and friable from long exposure.

No. 2. The bony part.

In the bed of a branch, in the N. ½ of N. E. ¼ of S. 33, T. 15, R. 7 W., there is the coal out-crop which is known as the *Key Bed.* Only the upper twelve inches of this coal out-crop could be seen; it is likely of the same seam as the P. P. Jones', Tom Bradley's, Bailey's, etc. beds. About one-half mile south-east of this out-cropping and some forty-five feet above it, there is said to be an out-crop of coal 8 ins. thick. About the same height above the *Key Bed*, there is under the *Double Falls*, in N. W. ¼ of S. W. ¼ of S. 34, T. 15, R. 7 W., an out-cropping of a seam of coal which is something over two feet in thickness. It is doubtless the under-split of (13) of the *General Section.* The two smaller branches which form the larger one in which the Key coal bed crops out, just before they come together, have a perpendicular *fall* of about ten feet each, and hence the name "*Double Fall Off Branch.*" Under each of these *falls*, the same coal seam makes its appearance, with about the following section :

Section of "Double Falls,"
in the N. W. ¼ of S. W. ¼ of S. 34, T. 15, R. 7 W.

(7) *Sandstone*; massive, in the more southern *fall* projecting several feet over the underlying rocks .... 3 ft. 0 in.
(6) *Shale, Sandstone;* the shale sandy and contains seams of sandstone, from .... 7 ft. to 8 ft. 0 in.
(5) COAL; from .... ¼ in. to 1 in.
(4) *Shale;* sandy, very firm and hard, from .. 4 in. to 6 in.
(3) COAL; good, upper split of (13) of the *General Section*, from .... 2 ft. to 2 ft. 4 in.
(2) *Shale;* bluish. .... 2 ft. to 3 ft. 0 in.
(1) *Sandstones*; slabby.

This coal is the same as the *Lennard bed.*

In Baker's Creek, in the N. E. ¼ of N. E. ¼ of S. 2, T. 16, R. 7 W., there is reported to be an out-cropping of coal, and in a branch in the N. E. ¼ of S. 3, T. 16, R. 7 W., there is an other coal out-cropping, which is some two feet in thickness and is near 100 feet above Key's coal bed. Coal crops out in Wolf Creek in the N. E. ¼ of S. 19, and in Lost Creek in the N. W. ¼ of S. 15, T. 16, R. 7 W.

Under a bluff in Mr. James I. Odom's field, in the S. W. ¼ of S. 16, T. 16, R. 7 W., there is an out-cropping of coal with the following section :

Out-crop in Mr. James I. Odom's Field,
in the S. W. ¼ of S. 16, T. 16, R. 7 W.

(4) *Shales ;* hard, form a bluff .... 20 ft. 0 in.
(3) *A dark gray rock* .... 6 in.
(2) COAL. .... 8 in.
(1) *Slate ;* clayey, stained, reddish, visible .... 3 ft. 0 in.

The coal at the above section appears to be lying about level. It is some forty-five to fifty feet above the coal in Lost Creek, and is either (12) of the *General Section*, or one of the *splits* of (13) of the *General Section.* The rock (3) of the above section is a gray, carbonaceous, micaceous, fossiliferous, sandy, marly looking rock; it becomes soft and friable and covered with a coating of copperas on weathering. It is full of pieces of shells that are very much decomposed. A sample of this rock gave, on analysis, the following results:

Specific gravity	2.544
Silica	71.349
Carbonate ot Lime	11.703
" " Magnesia	1.503
Ferric Oxide	2.702
Alumina and Phosphoric Acid	3.865
Undetermined and Loss	8.878
	100.000

Coal is said to occur in Wolf Creek, in S. 15, T. 16, R. 8 W., and in S. 19, T. 16, R. 7 W. There are out-crops of coal also in S's 22, 32, and 36, T. 16, R. 8 W., and in S. 32, T. 16, R. 7 W. Near the center of S. 32, T. 16, R. 7 W., in Mr. Wm. Odom's field, there occurs the following section:

Section in Mr. William Odom's Field, near the center of S. 32, T. 16, R. 7 W.

(8)	*Shale, Debris;* to general level of country	30 ft. 0 in.
(7)	*Sandstones;* slabby and hard	18 ft. 0 in.
(6)	*Shale, Sandstone;* sandstone in seams in yellowish clayey slate	18 ft. 0 in.
(5)	*Shale*; bluish	8 ft. 0 in.
(4)	*Clay;* carbonaceous	1 in.
(3)	COAL; at foot of bluff, about	1 ft. 0 in.
(2)	*Shale;* fossiliferous	3 ft. 0 in.
(1)	*Sandstone;* micaceous and yellowish, in bed of branch.	

This coal is, doubtless, of the same seam as the coal in Mr. James I. Odom's field, and the coal on Wolf Creek, in the S. E. ¼ of S. E. ¼ of S. 19, T. 16, R. 7 W., must be of a seam between forty and sixty feet lower than this coal. Just west of Little Indian Creek, there is in the S. E. ¼ of S. 36, T. 16, R. 8 W., a hill some 150 to 200 feet higher than the surrounding country. Near the foot of this hill or mountain, by the side of the road, there is an out-cropping from five to six feet thick, of seemingly fire clay. In the upper part of this clay out-cropping, there is a black, smutty streak, from five to six inches thick, which would doubtless lead back to coal. The above clay, though it is a little mottled on the out-crop, from the admixture of foreign ingredients, is but very little gritty and is *greasy* to the feeling. An average sample of several pieces of this clay, taken from different parts of the out-crop, gave, on analysis, the following results:

Analysis of Fire Clay from S. E. ¼ of S. 36, T. 16, R. 8 W.

Silica	60.805
Alumina	21.435
Ferric Oxide	4.888
Undetermined	12.872
	100 000

In a hole and under water in Little Indian Creek, in the south-east corner of the same quarter-section as the above clay out-cropping, there is an out-cropping of coal, which is known as the *Brown coal-bed.* Higher up this creek, or in the S. E. ¼ of S. W. ¼ of S. 36, T. 16, R. 8 W., there is more coal, and on the side of the hill and road, about thirty feet above the creek, there is an out-cropping of coal smut, which was visible to a thickness of thirty inches, and appeared to have a parting of slate. These coals are believed to be of (12) and (13) of the *General Section.*

On Big Indian Creek, in the S. E. ¼ of S. 25, T. 6, R. 8 W., there is said to be a rock-quarry. It is doubtless nothing more than one of the numerous out-croppings of beautiful flagstones, which are scattered all over Walker county. These rocks are used and have an excellent reputation in the neighborhood, for building chimneys, and for head and foot stones, and for coverings for graves.

In the S. E. ¼ of S. 27, T. 16, R. 8 W., there occurs about the following approximate section :

General Approximate Section,
in the S. E. ¼ of S. 27, T. 16, R. 8 W.

(8)	*Sandstone;* about	15 ft. 0 in.
(7)	*Shale*	4 ft. 0 in.
(6)	COAL; (14) of the *General Section,* visible	11 in.
(5)	*Fire Clay.*	
(4)	*Shales;* hard, about	90 ft. 0 in.
(9)	*Clay;* reported	2 in.
(2)	COAL; of (13) of the *General Section,* reported	1 ft. 6 in.
(1)	*Fire Clay;* bed of creek.	

The coal (6) of the above section is doubtless of the same seam as the coal (5) of the approximate section near Rising Sun P. O., and (2) of the above section is either (3) or (2) of the section near Rising Sun P. O. Coal is said to occur in a well in the N. E. ¼ of the S. W. ¼ of S. 22, T. 16, R. 8 W.

From the bed of Lost Creek, just below the mouth of Wolf Creek, boat-loads of coal are said to have been raised from an out-cropping that is eight feet thick. It is (11) of the *General Section.* This same seam of coal also crops out in Lost Creek just above and below *Price's ford* or the crossing of the Jonesboro road. Just above this ford it crops out in *Falls Branch,* near the mouth, in the S. W. ¼ of N. W. ¼ of S. 26, T. 16, R. 7 W., where it has the following section:

Section at the Mouth of Falls Branch,
in the S. W. ¼ of N. W. ¼ of S. 26, T. 16, R. 7 W.

(5)	*Measures*	125 ft. 0 in.
(4)	*Sandstones;* in seams 18 inches and 20 inches thick; shaly in places	40 ft. 0 in.
(3)	*Slate*	3 ft. 0 in.
(2)	COAL; about	2 ft. 0 in.
(1)	*Slate.*	

The State Geologist in his report for 1879–80, gives the following as a section of an out-cropping of this same seam of coal on Falls Branch:

Section on Falls Branch, in S. 22, T. 16, R. 6 W.

(7)	*Sandstone;* slaty.	
(6)	COAL; good and hard	1 ft. 0 in.
(5)	*Black Shale*	3 in.
(4)	COAL	3 in.
(3)	*Slate;* dark gray	6 in.
(2)	COAL; soft, bony	1 ft. 0 in.
(1)	*Slate;* hard.	

There are folds in the strata which throw this seam of coal under the bed of Lost Creek at the mouth of the above branch and at the above ford. Just over this coal seam in Lost Creek at the mouth of Falls Branch, there is a light gray siliceous rock that is fossiliferous and is full of streaks and spots of calcite. Just below the above ford, there is on the north bank of Lost Creek an old shaft which was sunk down to this seam of coal, (11) of the *General Section,* and from which coal was raised years ago. An out-cropping of this seam of coal in the bed of Lost Creek, near the above old shaft, is said to have the following section:

Coal Out-Cropping in Lost Creek,
in the S. E. ¼ of N. E. ¼ of S. 22, T. 16, R. 6 W.

(3)	COAL	10 in.
(2)	*Slate*	1 ft. 2 in.
(1)	COAL	4 ft. 0 in.

This same seam of coal crops out in several places on *Fanny's Branch,* which empties into Lost Creek about one-half of a mile from its mouth. At one of these out-crops on Fanny's Branch, about 100 yards from its mouth, the following section occurs:

Section of Coal Out-crop on Fanny's Branch near its Mouth, in the N. W. ¼ of N. E. ¼ of S. 26, T. 16, R. 7 W.

(5)	*Slaty Sandstone;* forming a very hard and compact covering.	
(4)	COAL	1 ft. 10 in.
(3)	*Slate*	8 in.
(2)	COAL	6 in.
(1)	*Slate;* bluish, down to water level	2 ft. 6 in.

Prof. Tuomy observed these coal out-croppings on Fanny's branch as far back as 1849, and gave, in his "First Biennial Report," the following as a section of one of them:

Section on Fanny's Branch.

(5)	COAL	16 in.
(4)	*Shale*	4 in.
(3)	COAL	15 in.
(2)	*Shale*	12 in.
(1)	COAL	6 in.

He also observed on Fanny's branch a slight fault, in which the strata are displaced about one foot.

On the east side of the river on a branch, from 150 to 200 yards from its mouth or from the river, or in the N. E. ¼ of S. 35, T. 16, R. 7 W., there are the following out-crops of this same seam of coal:

Out-Cropping in the N. E. ¼ of S. 35, T. 16, R. 7 W.

		(1)	(2)
(10)	*Sandstone, Shale.*		
(9)	COAL	7½ in.	COAL 1 ft. 2 in.
(8)	MINERAL CHARCOAL	½ in.	
(7)	COAL	4½ in.	
(6)	*Slate,* black	1 in.	Clay slate 2 in.
(5)	COAL	1 ft. 1 in.	Under water, felt to a thickness of 7 in.
(4)	*Slate;* clayey	3 in.	
(3)	COAL	2 in.	
(2)	*Slate;* clayey	3 in.	
(1)	COAL; visible	1 ft. 0 in	

Section (2) is about fifty yards to the south-east of (1), or higher up the branch. The dip of these out-crops is to the south-east. The whole thickness of this coal does not show even in the out-crop (1), for the bottom of the coal (1) could not be seen, and there cropped out, from about two feet under it, a stratum two inches thick, of hard slaty coal, and farther down the branch and about four feet still lower, there was an out-cropping of coal about four inches thick. Thin out-croppings of coal were seen along the branch all the way down to its mouth; they were all likely of this same seam of coal. This seam of coal also crops out higher up the river, on the same or east side, on a small branch in the S. W. corner of S. 24, T. 16, R. 7 W. Of this last coal out-cropping, the State Geologist gives, in his report for 1879-80, the following section:

Section on the East Side of the River, just above the Mouth of Lost Creek.

(13)	*Sandstone;* slaty and bluish.	
(12)	COAL; good, hard	1 ft. 0 in.
(11)	*Black Shale*	2 in.
(10)	COAL; good	8 in.
(9)	*Slate;* parting	¼ in.
(8)	COAL	1½ in.
(7)	*Parting*	⅛ in.
(6)	COAL; good	8 in.
(5)	*Slate;* clayey, light color	2 in.
(4)	COAL; soft	1½ in.
(3)	*Slate*	2½ in.
(2)	COAL; good	1½ in.
(1)	*Slate;* fossiliferous, visible	1 ft. 0 in.

An average sample of a vertical section of the above coal out-cropping, less the partings, gave the following analysis:

Specific Gravity	1.339
Sulphur	1.105
Moisture	4.535
Volatile Matter	26.407
Fixed Carbon	56.890
Ash	12.168
	100.000

Higher still up the river, in the upper part of *Brake's bend* or in S. 30, T. 16, R. 6 W., there is an other out-cropping of this thick slaty seam of coal of which the following is a section, given by the State Geologist in his report for 1879-1880:

Coal Out-cropping in Brake's Bend, in S. 30, T. 16, R. 6 W.

(9)	*Slate, Sandstone;* roof.	
(8)	COAL; good, hard	8 in.
(7)	*Shale;* black	1 ½ in.
(6)	COAL; good	4 in.
(5)	*Slate:* parting	¾ in.
(4)	COAL;	4 in.
(3)	*Slate;* parting	1 in.
(2)	COAL	11 in.
(1)	*Slate;* hard, grayish, fossiliferous, seen to a thickness of	10 in.

This same seam of coal, (11) of the *General Section,* crops out in several other places on Fanny's branch than the out-crop near its mouth, of which sections have already been given. In one of these other out-crops, about one-hundred yards higher up the branch than the coal out-cropping near the mouth of the branch, the coal projects about one foot and six inches above the water, and in an other out-cropping, about one-hundred yards still higher up the branch, the coal shows about one foot above the water. The farthest up the branch of these out-crops that are known of or the one in the N. W. ¼ of N. E. ¼ of S. 14, T. 16, R. 7 W., is some forty-five feet above the level of Lost Creek at the mouth of Fanny's branch and is said to be between five and six feet in thickness.

The top of the ridge in *Brake's bend,* by Aneroid readings, is some four hundred feet above the level of the river at the mouth of Lost Creek. Below the mouth of Lost Creek an out-cropping of coal was seen by Prof. Tuomy upon a hill side, sixty to eighty feet above the level of the river. He says that the coal is so completely drained that it is quite rusty on the out-crop. He gives the following section of it:

Coal Out-Cropping below the Mouth of Lost Creek.

(5)	COAL	8 in.
(4)	*Shale*	1¼ in.
(3)	COAL	1 ft. 2 in.
(2)	*Clay*	1 in.
(1)	COAL	1 ft. 3 in.

This coal is the *upper split* of (13) of the *General Section* or is the same as (9) of the following section of out-crops in the *Franklin's bend*, at the foot of the *Franklin Shoals :*

Section in Franklin's Bend, at the Foot of Franklin's Shoals, in S. 25, T. 16, R. 7 W.

(13)	*Measures;* to top of ridge, about		135 ft. 0 in.
(12)	*Shale;* yellow		10 ft. 0 in.
(11)	*Sandstones*; in seams, about		4 ft. 0 in.
(10)	*Slate*		2 in.
(9)	Coal ... 2 ft. 2 in. *Slate;* black ... ½ in. Coal ... 11 in.	Van Hoose upper mine, *upper split,* of (13) of *Gen. Sec.*	3 ft. 1 ½ in.
(8)	*Shale, Sandstones;* the sandstones in thin seams in the shale		25 ft. 0 in.
(7)	*Slate;* curled, yellow		2 ft. 0 in.
(6)	Coal ... 11 in. *Slate* ... ½ in. Coal ... 3 in. *Slate* ... ½ in. Coal ... 1 ft. 11 in.	Van Hoose lower mine; *under split* of (13) of *Gen. Sec.*	3 ft. 2 in.
(5)	*Shale, Debris*		20 ft. 0 in.
(4)	Coal; showing only		3 in.
(3)	*Fire Clay*; showing		1 ft. 0 in.
(2)	*Debris*		10 ft. 0 in.
(1)	*Sandstones;* slabby, coarse grain, and of a yellowish gray color, forming foot of Franklin Shoals.		

These mines were abandoned long since, with that of all traffic by the river. They were very favorbably located for cheap mining during these times of river navigation. Both seams of the above section were opened up, but only the upper one was ever worked. A drift was driven into this upper seam and from the mouth of the drift, there extended a shoot almost down to the water's level. Though the props in this mine have long ago rottened and fallen down, the cover is still standing firm and solid.

The following analyses were made of average samples which represent vertical sections of those two coal seams, less the partings :

	(1)	(2)
Specific Gravity	1.331	1.308
Sulphur	1.137%	1.222%

Moisture	1.903%	2.250%
Volatile Matter	23.873%	28.290%
Fixed Carbon	56.207%	60.794%
Ash	18.017%	8.666%
	100.000	100.000

No. 1, was taken from the out-crop of the Van Hoose's lower seam. It was a dry coal which was badly weathered. It was partly stained an orange color from a coating of iron rust. Portions of it was very hard while other parts of it easily crumbled. Some of it had a *cannel coal* look and some had a shiny, tarry appearance, though the most of it was of a dull color. It seemed to coke poorly and had a reddish gray ash.

No. 2, was taken a few feet within the old mines on the Van Hoose's upper seam. On a fresh surface, the coal had a bright, lustrous, peacock color. It was badly weathered and some of it was stained an orange color by iron oxide. Some of it was very hard, while other portions of it was a little shaly and still other portions of it easily crumbled. It contained some mineral charcoal and had a red ash.

Up the River from these out-crops, something better than a mile, or in an old field on the south side of the River in the N. W. ¼ of S. E. ¼ of S. 30, T, 16, R. 6 W., there are several out-croppings of the *Van Hoose's upper seam.* In a branch just north-east of this old field, both of these seams or *splits* of the Coal Valley, etc., coal crop out. The upper seam or *split* makes its appearance some six hundred yards from the mouth of the branch or from the river, in the N. E. ¼ of S. E. ¼ of S. 30, T. 16, R. 6 W., about as follows:

Out-Cropping in the N. E. ¼ of S. E. ¼ of S. 30, T. 16, R. 6 W.

(9)	*Shale.*	
(8)	COAL	7 in.
(7)	*Slate*; black, irregular, about	¼ in.
(6)	COAL	2 in.
(5)	*Slate*; black, shaly	2 in.
(4)	COAL	3 in.
(3)	*Mother of Coal*	½ in.
(2)	COAL	1 ft 3 in.
(1)	*Slate.*	

About half way between this out-cropping and the mouth of the branch, or the river, the Van Hoose lower seam, or the *under-split* of (13) of the *General Section*, crops out in the bed of the branch, but it was badly covered up by debris. From this last out-cropping of coal, one or more boat loads of coal have been raised and floated down the river. This last coal out-cropping is just down the river from the *Franklin's bluff*, on the south-east side of the river. Under the upper end of this bluff, or about one-fourth of a mile up the river, or north-east of the last out-cropping of coal, this same Van Hoose lower seam of coal crops out in several places. In one of these places, it showed as follows:

Out-Crop under Franklin's Bluff,
in the N. E. ¼ of N. E. ¼ of S. 30, *T.* 16, *R.* 6 *W.*

(7)	*Sandstone.*	
(6)	*Slate*	2 in.
(5)	COAL	10½ in.
(4)	MOTHER OF COAL	½ in,
(3)	COAL.	10 in.
(2)	*Slate*; clayey	1 in.
(1)	COAL; visible	2 in.

In none of these coal out-crops under the Franklin's bluff could the full thickness of the seam of coal be seen, though some of them, in time, it is said, have shown a thickness of four to five feet. In the bed of a branch just up the river from this bluff, or about two hundred and fifty yards south-east of the coal out-cropping, under the bluff, of the last section, and some ten feet lower, there is an other out-cropping of coal, which is doubtless of this same Van Hoose lower seam. The coal of this out-cropping showed to a thickness of about twenty-two inches. It had a dip to the south-east. At the mouth of this branch, there is an out-cropping of coal in the bed of the river, which is said to be between five and six feet in thickness. It covers the bed of the river, and shows, during low stages of the river, under the water, near the banks. It seems to be covered by a hard slaty sandstone, and to have a dip to the south-east. It is of a seam that is twenty to twenty-five feet below the Van Hoose lower seam, or is of the same seam as occurs on Fanny's Branch, or (11) of the *General Section.* Higher up the river, nearly one mile from this coal in the river, or in the N. E. ¼ of S. W. ¼ of S. 19, T. 16, R. 6 W., there is in the Franklin's bend the following out-cropping:

Out-Cropping on the North-east Side of the Franklin's Bend, or in the S. E. ¼ of the S. W. ¼ of S. 19, T. 16, R. 6 W.

(11)	*Measures*; some		250 ft. 0 in.
(10)	*Debris*; containing *loose* LIMESTONE *boulders*, which are fossiliferous and of a dark blue color, and from a few inches to several feet in diameter		50 ft. 0 in.
(9)	*Slate*		8 ft. 0 in.
(8)	*Sandstones, Slate*; the sandstones are slaty and micaceous, and are in seams from one-half foot to two feet in thickness, which are separated by from one inch to three inches of slate		8 ft. 0 in.
(7)	*Slate*		1½ in.
(6)	*Black Shale*		2 in.
(5)	COAL	Van Hoose's upper seam, *upper-split* of Coal Valley, etc., coals	9 in.
	Slate		1½ in.
	COAL		4 in.
	Slate		½ in.
	COAL		1 ft. 9 in.
(4)	*Slate.*		
(3)	*Shale, Sandstones*; forming a bluff covered with ferns		15 ft. 0 in.
(2)	*Sandstone, Debris*; the sandstones are curled and slaty, and of a dark gray ashy color		30 ft. 0 in.
(1)	*Fire Clay*; showing		8 in.
	COAL; in edge of water, thick seam.		

Coals (1) and (5) of this section are (11) and the *upper-split* of (13) of the *General Section*, or (4) and (9) of the preceding section at the foot of Franklin's Shoals; coal (1) is also the same as the preceding out-crop in the river. The rocks of this last section appear to dip to the south-east. An average sample of the full thickness of the out-cropping of the coal (5) of the above section, less the slate partings, gave, on analysis, the following results:

Specific gravity	1.352
Sulphur	.507%

Moisture at 110°C	6.004%
Volatile Matter	28.840%
Fixed Carbon	59.958%
Ash	5.189%
	100 000

The above coal is a very dry or well drained coal, which, on the weathered surfaces, is stained an orange color by iron rust, and on a fresh surface is of a dry, tarry look. It is a cubical coal, or rather breaks out in blocks, and does not seem to coke well, and has a pink ash. In this section the Van Hoose lower seam is covered by the debris of (2). The limestone of (10) of the above section was seen only in loose pieces along the bottom of a trough-shape depression, on the side of the ridge, just at the foot of the high, perpendicular bluff. This trough-shape depression, which was doubtless originally due to a *gaping open* or splitting of the strata along a perpendicular plane of division, is from two hundred and fifty to three hundred feet long, from E N E. to W S W., from twenty-five to thirty feet wide and from ten to twelve feet deep. The limestone of this trough or depression is very hard and compact; it is of a dark bluish gray color, and some of it is very fossiliferous, or is full of crinoidal stems. Some of it also contains streaks of calcite. An average sample of a half-dozen or more pieces of this limestone, gave the following analysis:

Specific gravity	2.713
Silica	17.272
Carbonate ot Lime	74.140
" " Magnesia	2.267
Peroxide of Iron	1.863
Alumina and Phosphoric Acid	1.271
Undetermined and Loss	3.187
	100.000

On the opposite side of the river, or in *Payne's bend*, on a branch in the N. W ¼ of S. E. ¼ of S. 19, T. 18, R. 6 W., there is an out-cropping of coal that showed to a thickness of only seven inches, which is some forty to fifty feet above the river. This out-cropping dipped to the north-west.

On an other branch in the N. W. ¼ of N. W. ¼ of S. 19, T. 18, R. 6 W., and some twenty-five to thirty feet above the river, there is an other out-cropping of coal, which is said to be ten inches thick. These last two coal out-crops are likely of the same seam, which is believed to be (12) of the *General Section.* About one-fourth of a mile north of this last coal out-cropping, or on the side of the hill at Payne's old ferry, in the S. E. ¼ of S. W. ¼ of S. 18, T. 18, R. 6 W., about thirty feet above low water in the river, there is an other coal out-cropping which is about twelve inches thick. This coal is also doubtless of the same seam as the last two out-crops. Just across the river from this last coal, or on the north side of the river at *Payne's old ferry,* and some sixty feet above the river, there is the following out-cropping of coal:

Out-Cropping on the North Side of the River at Payne's Old Ferry, in the S. E. ¼ of S. W. ¼ of S. 18, *T.* 18, *R.* 6 *W.*

(5)	*Sandstone*; slabby and flaggy, bluff.	
(4)	*Debris*, about	8 ft. 0 in.
(3)	*Shale;* with plant impressions, about	12 ft. 0 in.
(2)	COAL; *under-split* of (13) of *General Section*	2 ft. 3 in.
(1)	*Slate;* hard, may be a parting.	

This coal is believed to be of the *Van Hoose lower seam.*

Down the river about a half mile from the last coal out-cropping, there is said to be an other showing of coal of about the same height above the river as the last coal and which is doubtless of the same seam. About one-fourth of a mile up the river from Payne's old ferry or about one-half of a mile down the river from the mouth of Rattlesnake Creek, there is, under a bluff on the south or Payne's bend side of the river, in the N. W. ¼ of N. W. ¼ of S. 20, T. 18, R. 6 W., an out-cropping of coal smut which appears to be some three and a half feet thick. It is about twenty-five feet above low water in the river, though it may be in a slide and hence may be somewhat below its proper position. Some 150 yards down the river from this last coal out-cropping, there is said to be in the bed of the river and hence about thirty feet below this last coal, an other coal out-cropping. These two coals are likely of the Van Hoose lower seam, or the *under-split* of (13) of the *General Section*, and of (11) of the *General Section.*

On a branch of Rattlesnake Creek, or in the S. E. ¼ of N. E. ¼ of S. 20, T. 16, R. 6 W., there is the following out-cropping:

Out-Cropping in the S. E. ¼ of N. E. ¼ of S. 20, T. 16, R. 6 W.

(5)	*Shale*; bluff		10 ft. 0 in.
(4)	COAL	Under-split of (13) of *General Section*	1 ft. 6 in.
(3)	*Slate*; clayey		¼ in.
(2)	COAL		10 in.
(1)	*Slate*; visible		1 ft. 0 in.

This coal crops out again just over the divide from the last, on the next branch up Rattlesnake Creek, or in the N. E. ¼ of S. E. ¼ of S. 20, T. 16, R. 6 W., as follows:

Out-Cropping in the N. E. ¼ of S. E. ¼ of S. 20, T. 16, R. 6 W.

(4)	*Shale*; curly	12 ft. 0 in.
(3)	COAL; good and hard	1 ft. 4 in.
(2)	*Slate*	¼ in.
(1)	COAL; visible	4 in.

Some 250 yards down the branch, or to the north-west from this last coal out-cropping, and twelve to fourteen feet lower, this same seam of coal makes its appearance again in an out-crop about thirty inches thick. It also shows again, about the same thickness, some twenty-five to thirty yards still lower down the branch, where it has, some sixteen inches from the top, a clay slate parting from four to five inches thick. These out-croppings are doubtless all of the same seam which is believed to be the same as the Van Hoose lower seam. About 150 yards west of this last coal out-cropping, there is said to be in the bed of Rattlesnake Creek an out-cropping of coal that is eighteen inches thick. This coal must be of a seam that is some twenty-five feet lower than the one of which we have just been speaking. About 100 yards south of this last out-cropping, on a branch seventy-five yards from its mouth or from Rattlesnake

Creek, there is visible twelve to fourteen inches of coal which is believed to be of the higher of the two seams just spoken of. Farther up Rattlesnake Creek, or to the south about one-fourth of a mile, there is an out-cropping of coal under debris that showed four inches thick to a thin parting of black slate. It is some twenty-feet higher than the last coal out-crop and is doubtless of a higher seam. It may be of the Van Hoose's upper seam. Farther still up Rattlesnake Creek or to the south some 350 yards and some fifteen feet still higher, there is an out-cropping of coal twelve inches thick, under debris and over fire clay. It is probably of the same seam as the last or the upper-split of (13) of the *General Section.*

V. Coal Out-Crops, in the South-eastern Corner of the County, on Friley's Creek, Short Creek, and the Warrior River near Fork Shoals.

The following section of these coal out-crops, given by the State Geologist in his report for 1879–80, coincides very closely with our own :

Section of Coal Measures near Fork Shoals.

	Laminated Sandstones	20 ft. 0 in.
(3)	COAL; upper seam	2 ft. 0 in.
	Slates, Sandstones; sometimes laminated. becoming massive in places	100 ft. 0 in.
	Bluish gritty slate	1 ft. 0 in.
(2)	COAL; variable thickness	3 in. to 1 ft. 10 in.
	Fossiliferous slate; with Sigillaria	2 ft. 0 in.
	Dark Slaty Sandstone; micaceous	12 ft. 0 in.
(1)	COAL; in bed of river	1 ft. 10 in. to 2 ft. 0 in.

The coals (1), (2) and (3) above are respectively (14), (15) and (16) of the *General Section.* The coals (1) and (2) crop out in a branch near Mr. F. A. Snow's, in S. 12, T. 17, R. 7 W., where the following section occurs :

Section along a Branch near Mr. F. A. Snow's, in S. 12, T. 17, R. 7 W.

(15)	*Sandstone;* slaty, slabby and flaggy.	
(14)	*A soft clayey looking rock;* fossiliferous, becomes very hard on exposure	6 in. to 8 in.
(13)	*Slate;* only a thin sheet.	
(12)	COAL; showing	6 in.
(11)	*Fire Clay*	2 ft. 0 in.
(10)	*Sandstone;* fossiliferous, slabby and shaly in places in lower part; hard and knotty in places, while soft in other places, washed out into holes	5 ft. 0 in.
(9)	*Shale*	5 ft. 0 in.
(8)	COAL	4 in.
	Slate; from	½ in. to ¾ in.
	COAL	1 ft 4 in.
(7)	*Slate*; a thin sheet.	
(6)	*Shale..*	6 in
(5)	*Clay*	2 ft. 0 in.
(4)	*Sandstone;* shaly and fossiliferous	4 ft. 0 in.
(3)	*Slaty Sandstones*	4 ft. 0 in.
(2)	*Sandstones*: massive, a little shaly on weathering, dove colored	8 ft. 0 in.
(1)	*Sandstones*; massive, cut up by seams into rectangular blocks which on weathering break up into slaty and small rectangular pieces	8 ft. 0 in.

An out-cropping of this lower seam of coal is said to occur near the *sulphur spring* of Mr. Snow's, in the south-east corner of S. 12, T. 17, R. 7 W., and of an out-cropping of it on Friley's Creek, in the S. W. ¼ of N. W. ¼ of S. 24, T. 17, R. 7 W., on Mr. John Richardson's land, the following section is given by the State Geologist:

Out-cropping on Friley's Creek, in the S. W. ¼ of N. W. ¼ of S. 24, T. 17, R. 7 W.

(4)	*Sandstone*; partly massive and partly laminated, with false beddings; gray color. At least	20 ft. 0 in.
(3)	COAL; good	4½ in.
	Slate; hard, compact	8 in.
	COAL; good	1 ft. 1 ½in.
(2)	*Slate*; hard and compact, with *Sigillaria*	1 ft. 0 in.
(1)	*Sandstone*; slaty.	

This same seam of coal also crops out about one-half mile still farther to the south-west, in what is known as the *Thomas' Bed*, in the south-east corner of S. 23, T. 17, R. 7 W., as follows:

Section of Thomas' Coal Bed,
in the S. E. Corner of S. 23, T. 17, R. 7 W.

(3)	*Sandstone;* slaty.	
(2)	COAL	5 in.
	Slate; hard, bluish	1 ft 0 in.
	COAL	1 ft. 6 in.
(1)	*Slate;* hard.	

Still further to the WSW., some three-fourths of a mile, and some twenty feet lower, or about the level of the river, there is an other out-cropping of this same seam of coal in what is known as the *Robinson's lower bed*, in the N. E. ¼ of N. W. ¼ of S. 26, T. 17, R. 7 W., on Short Creek, near its mouth. The State Geologist, in his report for 1879-80, gives the following section of the out-crops near the mouth of Short Creek, which includes this *lower seam* and the one above it:

Section of Out-Crops at Mouth of Short Creek,
in the N. E. ¼ of N. W. ¼ of S. 26, T. 17, R. 7 W.

(8)	*Sandstone;* slaty.	
(7)	*Sandstone;* hard, compact.	10 in.
(6)	*Sandstone;* slaty, bluish below	10 ft. 0 in.
(5)	*Slate*; gritty, bluish	1 ft. 0 in.
(4)	COAL; variable.	0 ft. 3 to 22 in.
(3)	*Slate*, with *Sigillaria*	2 ft. 0 in.
(2)	*Sandstone;* slaty, micaceous	12 ft. 0 in.
(1)	COAL; at level of Warrior River	1 ft. 10 in.

In the above report, the following three analyses are given of average sample of this lower seam of coal, respectively, from the *Richardson's, Thomas' and Robinson's beds:*

	(1)	(2)	(3)
Specific Gravity	1 268	1.280	1.336
Sulphur.	1.131	1.506	.722
Moisture	1.475	1.442	3.560
Volatile Matter	34.271	27.211	26.566

Fixed Carbon	59.128	66 000	64.288
Ash	5.126	5.347	5 646
	100 000	100.000	100.000

No. 1—From Richardson's bed, on Friley's Creek.
No. 2—From Thomas' bed.
No. 3—From Robinson's lower bed.

From both the *Thomas' bed* and *Robinson's lower bed*, boat loads of coal are said to have been raised years ago and floated down to Mobile. Coal is also said to occur in the Warrior River near the mouth of Hurricane, Valley and Friley creeks and just below Fork Shoals, all of which coal out-crops are likely of this same lowest seam.

The upper coal seam hereabouts, the uppermost one in Walker county, crops out in several places near Fork Shoals, where it is about one hundred feet above the river, and around Mr. John Richardson's, in S. 24, T. 17, R. 7 W., and also on Short Creek, in the S. W. ¼ of S. 23, T. 17, R. 7 W.

The out-crops of this seam near the Fork Shoals will be treated of hereafter under Jefferson county. Of its out-crop around Mr. Richardson's, the following sections are of three of them:

Coal Out-Crops near Mr. John Richardson's in the N. E ¼ of ¼ of S. 24, T. 17, R. 7 W.

		(1)	(2)	(3)
(4)	*Sandstones;* flaggy and slaty.		10 ft. 0 in.	
(3)	*Slate*	1 ft. 6 in.	3 ft. 0 in.	1 ft. 0 in.
(2)	COAL	4 in.	4 in.	2 in.
	Slate; fossiliferous	3 in.	2 in.	3 in.
	COAL	1 ft. 4 in.	1 ft. 6 in.	1 ft. 7 in.
(1)	*Slate.*			

Of the out-crops of this upper coal seam on short Creek, the State Geologist gives, in his report for 1879–1880, the following section of one of these that is some one hundred and thirty-five feet above the level of the river, on Mrs. Robinson's land, in the S. W. ¼ of S. 23, T. 17, R. 7 W.:

Section of Mrs. Robinson's Upper Coal Bed, in the S. W. ¼ of S. 23, T. 17, R. 7 W.

(3)	*Slate.*	
(2)	COAL; red and rusty on surface	11 in.
	Slate	5½ in.
	COAL; very red or rusty on surface	3 in.
(1)	*Slate;* as far down as seen.	

The character of the coal of this upper seam is seen from the following analysis of an average sample of it from one of the out-crops near Mr. John Richardson's house:

Specific gravity	1.310
Sulphur	1.076
Moisture	1.398
Volatile matter	30.647
Fixed carbon	62.183
Ash	5.772
	100.000

There is an out-cropping of coal, which is known as the *Gant bed,* on Short Creek, in the S. E. ¼ of S. 15, T. 17, R. 7 W., that is likely of one of the lower of the above three seams.

There are out-croppings of coal visible in the following and perhaps in many other *sections* in Walker county:

Localities of Visible Coal Out-Crops in Walker County.

S's,	20, 22, 29, 31, 32	T. 12,	R. 7 W.
“	19, 28, 31, 38, 34, 36	“ 12,	“ 8 “
“	19, 25, 27, 28, 31 34	“ 12,	“ 9 “
“	20, 24, 25, 26, 27, 28, 34, 35	“ 12,	“ 10 “
“	18, 19, 33, 34	“ 13,	“ 5 “
“	8, 10, 18, 19, 21, 22, 27, 34	“ 13,	“ 6 “
“	10, 15, 19, 24	“ 13.	“ 7 “
“	1, 2, 7, 9, 10, 12, 13, 14, 25, 34, 35, 36	“ 13,	“ 8 “
“	1, 2, 6, 8, 12, 16, 17, 18, 19, 20, 21, 23, 26, 29, 30, 31, 33, 34, 35	“ 13,	“ 9 “
“	2, 3, 11, 12, 16, 18, 20, 24, 25	“ 13,	“ 10 “
“	4, 5, 16. 17, 18, 20, 21, 22, 28, 29, 30, 32, 33, 34	“ 14,	“ 5 “
“	9, 10, 14, 15, 17, 19, 22, 23, 26, 28, 29, 30	“ 14,	“ 6 “

S's, 16, 19, 20, 27, 28, 29. 30, 32, 33	T 14,	R 7 W.
" 2, 4, 7, 8, 9, 10, 13, 15, 16, 17, 18, 19, 21, 25, 31, 34	" 14,	" 8 "
" 1, 2, 10, 11, 13, 16, 29, 31, 32, 34, 35	" 14,	" 9 "
" 3, 4, 6, 7, 10, 16, 18, 30, 32	" 15,	" 5 "
" 4, 7, 8, 9, 12, 13, 14, 15, 16, 17, 22, 24, 26, 32, 34	" 15,	" 6 "
" 2, 5, 6, 15, 19, 20, 22, 23, 24, 25, 26, 27, 28, 30, 31, 32, 33, 34, 35	" 15,	" 7 "
" 6, 9, 10, 12, 13, 15, 19, 20, 21, 22, 24, 25, 26, 27, 28, 29, 31 32, 33, 34, 35, 36	" 15,	" 8 "
" 1, 3, 13, 22, 23, 25, 26, 27, 28, 33, 34, 35, 36.	" 15,	" 9 "
" 5, 6, 7, 8	" 16,	" 5 "
" 1, 2, 3, 13, 18, 19, 20, 30	" 16,	" 6 "
" 2, 3, 4, 5, 6, 14, 15, 16, 19, 21, 22, 23, 24, 25, 26, 31, 32, 35	" 16,	" 7 "
" 2, 4, 5, 6, 8, 10, 15, 22, 27, 31, 36	" 16,	" 8 "
" 6, 12, 16, 23, 24, 25, 26, 27	" 17,	" 7 "

II. DRIFT.

The *Drift* of Walker county, as has been stated, covers a comparatively small area. It is no where continuous but is altogether of patches which cap some of the highest points, and in spots of *loose* and *washed material* along the principal streams. It is most abundant in the north-western part of the county where it reaches a thickness of fifty feet over a few of the highest points; elsewhere in the county, the spots covered by it are small and it is thin. It consists principally of rounded pebbles and sands, with some clays, ferruginous sandstones and conglomerates, and siliceous iron ores.

7. JEFFERSON COUNTY.

TOPOGRAPHY, ETC.

Jefferson County, prior to the great Appalachian revolution, was composed entirely of Coal Measures, without a rock of any other formation to be seen. It still consists of these measures with the exception of the older and lower rocks, geologically speaking, of the long narrow anticlinal valley, known as Jones' Valley, in which Birmingham is situated. This anticlinal valley runs through the county in a general north-east and south-west direction and divides the county into two unequal parts ; it is also the water divide between the Warrior and Cahaba rivers and hence separates the Warrior and Cahaba coal fields.

We shall confine ourselves in the following pages to that part of the county north-west of the above anticlinal valley or to that part of it which is composed entirely of the coal measures of the Warrior coal field. This portion of the county is of a rectangular shape, extending lengthwise with the anticlinal valley, and is about forty-three miles long by twenty-five miles wide, comprising about two-thirds of the county or about six-hundred and thirty square miles. As a whole, it is a great synclinal trough or *scoop shape* depression, with all of its south-east rim and about two-thirds of its north-west border, parts of great and parallel anticlinal folds. As might be supposed from the above, the anticlinal fold of the south-east rim extends clear through the county while the one of the north-west side reaches only two-thirds of the way through the county. The one of the north-west border is the undenuded south-west end of Brown's valley, as an anticlinal ridge, as it gradually dies away. Of these two folds or rims, the south-east one is much the higher, though a portion of this south-east rim, as it is in a *down-throw*, along faults, one of which is between it and the anticlinal valley, is not very elevated. The south-west third of the north-west border is not of an anticlinal fold, as it is south-west of the termination of the north-west fold and is of a comparatively low country, the county line for the greater part of this distance being the Warrior River itself. The county line along this north-west side, as well as on the south-west side, was principally the crest of a water divide, at the time it was run off, and its exact position, in many places, is not exactly known. The elevated south-east rim, with the exception of the portion in the *down-throw*, is composed for the most part of the hard and massive conglomerate, known as *millstone grit*, and sandstones near the base of the coal measures, while the rocks of the north-west border, though hard, are somewhat softer, lighter and higher in the measures, except in the extreme northern part of the county. This *millstone grit*, in its out-crops capping the south-east rim, is usually perpendicular or is so bent over on itself as to throw its bottom on top or to cause its dip to be to the south-east or to be reversed. Along the south-east face of this capping bluff or between it and the anticlinal valley, there is a mass of debris which hides the underlying rocks and covers, it is believed, a great fault for most if not all of the distance through this county. This south-east rim and the extreme northern and north-eastern portions of the county, might be said to belong to the *plateau* or *table land* region of the Warrior coal field, for they have as surface rocks the same hard weather-resisting conglomerates and sandstones near the base of the coal measures. These hard rocks, wherever they crop out, usually present bold and rugged faces, either as perpendicular and over-hanging bluffs or as barren and naked places. To such hard rocks as these, together with denudation and disturbances of the *Earth's* crust, are due most of the variety and picturesqueness of scenery, and hence the surface of this section, which we are considering, is most irregular and its physical features are most varied along the south-east and north-west boundary lines, where these hard rocks are most highly exposed and where the folding in the strata and denudation have been greatest. It is also true, from the weather-resisting qualities, that, as a rule, wherever these hard rocks are cut through by streams, the channels are narrow and the bottoms are rocky and the sides are precipitous. Over these rocky bottoms, and sometimes over the precipitous sides, there are scattered immense boulders which add much to the grandness and wildness of the scenery of such places. These narrow rocky channels are known as *the narrows*, as are the strips of land, when very narrow, which separates two streams or the same stream as it approaches a great bend.

Being a trough, this area under consideration, in a general way, is made up of two great though very unequal water-sheds; the one on the south-east, or the north-west water shed of the elevated south-east rim, is much the greater or comprises most of the area. Within this synclinal trough, or between its two great bordering anticlinal folds, and especially on the north-west water shed of the south-east border, there are numerous smaller ridges which run generally up and down the trough or parallel to the two outside ridges or folds. These inside or smaller ridges are the results of waves and the out-croppings of the harder and more indestructible strata.

This area is admirably drained, as it has extending through its whole length a swift running river along near the juncture of the two great water sheds or the bottom of the synclinal trough, and, every few miles, along the water-sheds, large streams with rapid currents, which empty into the great drainage channel, the river. The top of the elevated south-east rim is from one hundred to three hundred and fifty feet above the anticlinal valley and from three hundred to six hundred feet above the river, which is some two hundred feet below the general level of the adjacent country. The lowest portions of this anticlinal valley have therefore a greater elevation than the mountainous country just outside of its raised limits, and, as all of the streams which rise in the anticlinal valley eventually break through its rocky barriers and flow into the mountainous country on one side or the other, we have *a valley which is a water divide in a mountainous country.* Along the water courses, the country, as a general thing, is considerably broken, but, between them, it is comparatively level or gently rolling. On the level tops of the divides, there are numerous deep beds of sand, which doubtless cover the out-crops of friable sandstones. There are on the tops of these divides, also some comparatively low and swampy places, which are surrounded by a growth principally of dog-wood. On these divides, as well as along the water courses, there are a few scattering small spots of rounded pebbles, which have been derived mainly from *dolomitic chert,* though some of them are of flint. These pebbles of flint, probably in some instances, came from the disintegration of conglomerates.

Growth.—This area is still almost completely covered with its native growth, the largest of which consists mainly of the different kinds of oak and short leaf pine, with a considerable mixture of long leaf pine, hickory and gum, and with some cypress, poplar, etc., etc. The oaks are mainly post oaks and black-jacks. The chestnut, though it once abounded over these highlands, is now almost extinct, with the exception of the young sprouts around the old stumps. The cypress and poplar, which were once quite common in the hollows and ravines of these coal measures, and were of fine growth, are also becoming quite scarce. The growth of these measures shows most plainly that there is a close relationship between the growth and the nature of the underlying strata, for it is so marked that a most casual observer will notice a change from the pines to the oaks as he passes from over the out-crops of more siliceous strata, as sandstones and conglomerates, to those of a more clayey nature, as shales.

Soil. – The soil is mainly of a fine siliceous texture and of a light ashy gray color; it is derived chiefly from the disintegration of soft and shaly rocks, and is, as a general thing, poor for the farmer but quite good with frequent light applications of a lime compost for the nurseryman and the horticulturist. It is also well adapted to the grape, which, with the proper care and cultivation, it grows to perfection. The cleared and tillable lands of this area are principally along the branches and small streams over the tops of the divides; the larger streams, between these divides, having but very little, if any, first and second bottoms.

GEOLOGICAL FORMATIONS.

COAL MEASURES.

As stated, the surface geology of this part of Jefferson county is composed entirely of the coal measures of the Warrior field. The prevailing and average dip of the strata of these measures, as a whole, is some 3° to 4° to the south-west, though, of course, the strata of the two sides have, in addition, general dips in opposite directions to each other, or to the north-west and south-east, or towards the centre of the basin or synclinal trough. The strata along the central or bottom of this great synclinal trough, are also in long flat waves in the direction of the trough, or from north-east to south-west, while those of the two sides are in similar but shorter waves, which run in a perpendicular direction, or from north-west to south-east. The out-crops of the upper strata bear away from the edges of the trough, in curves, as they run around the ends of the trough, and become more and more slanting in their dips as they get farther and farther away from the edges. The south-east edge of this trough or area is especially complicated by folds and faults. The folds, with the exception of some flat waves, have only one general direction, which is from north-east to south-west, while the faults in a general way, not only run in the same direction but also at right angle to it. In the faults which run north-east and south-west, there seems to be, as a general thing, a much greater displacement of strata than there is in the others or in the cross faults, in which the displacement of strata appears to be usually quite small. These north-east and south-west folds and faults, do not always run exactly parallel to the anticlinal valley, and hence they sometimes run in and out from the anticlinal valley and cut off, with the anticlinal valley, or on the anticlinal valley side, strips from the coal measures. The *little basin*, which is some twelve miles long by three miles wide, is one of these strips of coal measures, which has been cut off from the lower south-west edge of the area under consideration by a combined fold and fault.

Little Basin.—This *little basin* is a complete *tray shape* depression, and hence is very similar in structure to the large trough of which it is a part. Only about one-half of this *little basin* is in Jefferson county; the lower or south-west half is in Tuscaloosa county.

Besides folds and faults, with their displacements, these measures are complicated in other ways; as, for instance, the same strata are always more or less variable, though it is believed not more so than in other coal fields; the number of strata, and the distance between two strata, which have been well recognized as the same at two localities only a few miles apart, are sometimes quite different. This difference is doubtless due to the splitting up of some by the interpolation of others, and by the variableness in the same strata, which may result in the thickening of a mere streak to a stratum many feet in thickness, or the reverse. Again, the strata frequently, without breakage, suddenly fall from one elevation to that of an other several feet lower, and, after a short duration, sometimes, at least, as suddenly resume or jump up to their former horizontal positions. The strata are also frequently falsely bedded, and oftentimes are cut up by perpendicular parallel planes of division which run in the directions of the faults or north-east and south-west and at right-angle to this general direction, and often-times give to the strata a flaggy structure.

The measures of this area, as the general dip of the strata to the south-west though small is greater than the inclination of the surface, are added to or increased in thickness in this general direction, from about 200 feet in the north-east corner of the county to over 3,000 feet in the down-throw of the central south-east side and along the county line in the south-west corner. They, as they are near the center of the original great coal basin of Alabama, are, with the exceptions of the elevated rims, of what is known in Tennessee and other States as the *Upper Measures.* As in other parts of the coal fields of Alabama, they consist of alternating strata of (1) *Shales,* (2) *Sandstones, Conglomerates,* (3) *Clays* and (4) *Stone Coals.* They also contain, locally at least, at several horizontal positions, some little impure fossiliferous carbonaceous limestone.

These different strata are all similar to what they are in other parts of the Warrior coal field, and as they have been sufficiently described in detail under other counties, they, with the exception of the *stone coals,* need not be dwelt upon extensively here.

Shales. These rocks make up much the greater part of the surface area of this section; they occur in strata from a few feet to nearly one hundred feet in thickness, and are principally of a lamellar structure, arenaceous nature and light gray color. Those of the thicker beds have frequently partings of flaggy and slabby sandstones, and are commonly knotty or curly, and often-times have streaks or interstratified seams of *black band iron ore* and layers of nodules of *clay iron stone.* Most of these shales are also fossiliferous and some of them, especially those near the coal seams, are full of beautiful and rare impressions of coal plants. These shales, near the coal seams, are also frequently of a bluish color and clayey nature, and when thoroughly wet become very plastic and sticky. The *black band iron ore* of these shales is known to be, locally, of four workable seams, which vary in thickness from sixteen inches to four feet; it also occurs in thinner seams, at other horizons. These seams of *coaly iron ore* are not always constant, either in thickness or composition, but in places give out and in other places change to real stone coal. The *clay iron stone* occurs not only as concretionary nodules but also as interstratified seams.

Sandstones, Conglomerates. These rocks are next in extent to the shales and are the rocks which give, with their bold, sharp and prominent points, most of the variety to the physical features of the country, and form most of the cascades and falls of the creeks and branches. They crop out, usually, as perpendicular and over-hanging bluffs, and sometimes form three and four prominent escarpments, one above the other, on the side of a ridge. Though ever so hard, these rocks on the out-crops finally succumb to weathering and frequently become strata of merely loose sand, which are sometimes of different colors and give to the out-crops strange and striped appearances. They are by no means regularly stratified and are frequently cut up by the parallel perpendicular planes of division which run north-east and south-west and at right-angle to this general direction. The sandstones are of the various kinds that have been described under other counties of the Warrior coal field. The massive variety, in many of its out-crops, are known to work and split with equal ease in all directions, and to make durable and beautiful building stones, while the flagstones are frequently all that could be wished of them, as they are of great uniformity in thickness and have perfectly smooth and beautifully ripple-marked sides. The conglomerates appear to occur at six to seven different horizontal positions, but in only four of these positions are they constant or ever present, as real conglomerates. These ever present conglomerates are to be found about forty feet, one hundred and forty feet, one thousand four hundred and fifty feet and three thousand feet above the base of the measures. The lowest two of these conglomerates are the *lower* and *upper conglomerates* of Tennessee. The lowest one is known in Alabama as *millstone grit,* and is the capping stone to the elevated south-east rim with the exceptions of those in the extreme north-east portion of the county and that in the *down-throw.* In its out-crops along the top of this rim, it is commonly either about perpendicular or is more than perpendicular, i. e., it is so bent over on itself as to throw its bottom on top or to cause its dip on the out-crop to be reversed to the south-east. It is a rock usually of very coarse and sharp grains with its pebbles, as in case of the other conglomerates, confined principally to streaks and patches near the bottom, though it is sometimes a very fine grain rock, like a buhrstone, and is then very hard indeed.

Much of the coarse grain kind becomes on weathering very friable or nothing more than masses of loosely coherent grains of sand with the pebbles through them; though it occasionally, when not quite so badly weathered, has an oolitic appearance. To the weathering of these and other sandy rocks, principally of the hard and massive or purer varieties, are due the deep sand beds that are frequently encountered in the roads over the coal measures. This sand, when free from pebbles, is fine for cements etc.; it is usually of a light color and is sometimes almost white; though some of it is stained reddish or pinkish. In the lower part of the more massive of these rocks, there are frequently to be seen, in the out-crops, *pot holes,* or rounded holes of somewhat the shape of pots, several feet in diameter. These holes once consisted of, or were once filled by concentric layers, from one to two inches thick, of shaly and softer materials, which, on weathering, have crumbled and fallen out and thus left the *pot holes* or molds of their former selves. The next to the lowest and next to the most massive of these conglomerates or the upper of the two conglomerates near the base of the measures, the one that is known in Tennessee, etc., as the *upper conglomerate,* was recognized, for certain, only in the extreme north-east portion of the county, where it occurs along the summits of the two bordering anticlinal folds. Elsewhere in this county where it ought to show or along the south-east rim, it is believed to be hid either in a fault or in a closed synclinal fold; though it may be in this rim united and one with the *lower conglomerate* or *millstone grit,* the intervening strata having thinned out, or it may be the conglomerate which we have taken for the *lower conglomerate,* this lower conglomerate itself having been hid by a fault, but neither of these last two suppositions is likely true. The other two of the four ever present conglomerates are to be found about one hundred and fifty feet below the *New Castle seam* and about forty feet below the *Pratt seam.* The local conglomerates or those rocks which are conglomerates only in localities, are from three to four in number and occur between the uppermost two of the ever present conglomerates or between the *New Castle* and *Pratt coal seams*, at about the distances of 1500 feet, 1700 feet, 1800 feet and 1950 feet, above the base of the measures. The two middle of these local conglomerate rocks are more often real conglomerates than the other two. The positions of these rocks can be seen in the *General Section*.

Limestone, as very impure or siliceous, dark colored, fosiliferous rocks, doubtless several feet in thickness, and as streaks of pure calcite in gray carbonaceous sandstones, occurs at about four horizontal positions in these measures or at about 1000 feet, 1300 feet, 1950 feet and 3000 feet above the base of the measures. In all of these positions it is believed to be merely local or to occur only in certain localities. The uppermost two of these positions of the limestone are seen to correspond with the uppermost two of the conglomerates; the other two positions of the limestone are between the *upper conglomerate*, at the base of the measures, and the middle conglomerate of the ever present conglomerates, or just below the *Black Creek* and *Nabers'* coal seams. A better idea of the positions of this limestone can be gotten from an inspection of the *General Section*.

Clays. The clays seem to be confined almost exclusively to the underbeds of the coal seams, though they are occasionally seen in out-crops without any visible coal near them. They are generally full of the stem and leaf impressions of coal plants, and, when thoroughly wet, are plastic and sticky. They are usually of a dark gray color, from the presence of a good deal of carbonaceous matter, and doubtless in the majority of cases, are a very good fire clay. The seams sometimes reach a thickness of ten feet or more, but usually they are from two to three feet thick.

Stone Coals.—This trough, or area under consideration, especially the north-east part of it, though seemingly the most complex or disturbed portion, yet, from its proximity to the railroads, has received much more attention, and hence is much better known than any other part of the great and rich Warrior coal field. It is known to contain the out-crops of thirty-nine different seams of coal, which vary in thickness from a few inches to fourteen feet and have an average aggregate thickness of more than eighty-five feet of pure coal. Most, if not all, of these coal seams are in waves, which run in the direction of the prevailing dip, and, as a rule, the coal seams are thicker in the hollows or troughs of these waves than they are on the crests of the waves. Some of these coal seams are, however, very variable and uncertain in both thickness and composition, though the most of them are believed to be as uniform in all respects as the bituminous coals of any other State. All of the thicker seams have, interstratified in the coal, more or less bands of slate, and some of them have, extending up into their roofs, the miner's *pot holes* and *hog backs*, from which the coals and slates easily fall out on being undermined, and thus render the mining of such seams a little dangerous to the miners.

Among the miners, there are to be seen Americans (principally natives), Germans, Irish, Welsh, English, Swedes, French, Scotch, Austrians, Swiss, Bavarians and Africans (principally natives). The outside laborers at the different mines are principally Americans or native whites, while the miners, strictly speaking, are chiefly the foreigners and native blacks. The native blacks make very good miners.

The State and county convicts of Alabama, with but a few exceptions, are worked in the mines of the State, and we do not believe that those of them who are guilty of the greater offenses could be better disposed of or ought to be better treated than they are in these mines. We also do not see how *convict labor* could be brought in less competition with *free labor*, at any other occupation in which it would be a source of revenue both to the State and to the employers, than in these mines, where it is not only a source of revenue to the State and its employers, but is also a protection against strikes.

Some of these seams of coal split along the slate and clay partings, and though the separated parts generally, if not always, eventually come together again, they, in places, get to be thirty and forty feet apart. In these separations, the under stratum usually holds its proper horizontal position, while the upper part of the seam rises and falls, though this is not always the case. Most of these seams, from their impervious clay underbeds, carry lasting water, and their out-crops, in the directions of the dips, are frequently marked by *chalybeate springs*, which are commonly known to the country people, as sulphur springs. In addition to the beautiful and rare casts of twigs and leaves of coal plants, which usually abound in the shales near the coal seams, there have been seen, in several instances, fossil trunks of trees, from a few inches to several feet in diameter, standing perpendicularly upon the coal seams and extending up into the roofs.

In these thirty-nine seams of coal there are to be found almost every variety of bituminous coal; some of these coals are thought to be especially fitted for coking, for iron ore smelting, and for foundry and blacksmithing uses; others for heating and steaming purposes, and others still for gas making. Some of them are very pure, or contain a very large percentage of fixed carbon, with but very little ash and clinker, while others are very impure or are full of thin sheets of slate, which can be gotten out only by crushing and washing; some are soft and of a dull color, while others are hard and bright and will bear transportation well; some, in mining, break out as large lumps, which do not pulverize on handling, while others can be mined only as fine coal; some, on weathering, crumble quickly, while others, to the naked eye, are not effected for years; some have a regular *face and butt* structure, while others are entirely devoid of such; some in form are cubical, while others are columnar and flaggy, and others still have no regular forms at all; some contain considerable mineral charcoal in thin sheets along the planes of stratification, while others are perfectly solid and homogeneous throughout, and have no such planes of stratification; and some are dry and compact coals, though they hold considerable free gas, while others are highly bituminous and cake on burning or coke well.

The compositions of average samples of the full thickness of many of these coal seams are represented in the analyses throughout the body of this report and in the table of analyses at the end of this report. These analyses, though made with the greatest care of truly representative samples, and though they show the specimens analyzed to be far superior to the average bituminous coals, still they do not, by any means, represent the true value of these coals, for, with but a few exceptions, they were made of samples taken from the weathered out-crops, and there is no doubt but that most, if not all, varieties of bituminous coals, deteriorate very much on weathering It has been said by one high in authority on this subject, that some bituminous coals will suffer, from only a few months exposure, a loss of at least fifty per cent. of their value as fuel, and even much more than this for their gas giving qualities. Who can estimate therefore the loss that these samples of coal, of the out-crops that were analyzed, have sustained? Hence these analyses will be of more value and interest for merely a comparison of the different coals, for special purposes, than for representing their true qualities, as would be shown by freshly mined samples.

Coals are rendered not only much more difficult and expensive to mine when they have been subjected to disturbances of any kind, but are also as a general thing, very much injured in quality by such disturbances; for it has been noticed that most of coals near great faults and upheavals are not only of very variable thickness, but also are unusually impure. However, as a general thing, these coals of the Warrior field in this county are admirably suited to cheap mining, when close to transporting facilities. They crop out and hence can be reached by drifts and slopes in many parts of this area; and they have a small angle of dip, which enables the mines to be kept dry at comparatively small costs; and they usually have soft bottoms and hard covers, which, in but few instances, have to be kept up by propping, except on the very out-crops. The immediate coverings to the coals are most often hard shales for a few feet in thickness, when the harder and more massive rocks, sandstones or conglomerates, as the case may be, set in. Occasionally, however, the hard shale cover is very thick, especially over the thicker coal seams, and again, it is squeezed out entirely by the sandstones or conglomerates, which, in these instances, are the immediate coverings or are down next to the coals. The structure of these coals are also conducive to cheap mining.

These coals, as they have been and are still the most convenient to lines of transportation have been and are still being much more extensively worked than those of any other part of the Warrior coal field. For many years in ante-railroad times in Alabama, and from many places, these coals were raised in considerable quantities from the outcrops in the beds of the rivers and mouths of the streams near the rivers, during low stages of the water, and floated in flat-boats down to Tuscaloosa and Mobile, during freshets; but this business was so perilous to both life and property, that, on the advent of railroads through Alabama, it ceased, and it was not till the year 1872, on the completion of the South & North Alabama railroad, that the first coal mine was scientifically opened in the Warrior coal field, or in Jefferson county. In 1874, the out-put of coal for the whole year from this area, or from the Warrior coal field in Jefferson county, summed up to only 33,139 tons; now, there are in operation in this area twelve mines, which vary in out-put from 100 tons to 2,500 tons of coal each per day, and from three to four mines with daily out-puts of from ten to twenty-five tons of coal each per day, or a total daily out-put of coal from all of the mines of the Warrior coal field, in Jefferson county, of over 4,000 tons. Most of this coal is consumed for iron-ore smelting around Birmingham, and for steaming purposes on the railroads which pass through Birmingham; though much of it is used in the larger cities of the South for miscellaneous purposes.

With the aid of a section by Mr. T. H. Aldrich and one by Mr. Howard Douglas, we have been enabled to make out the following section, which we believe to be about as near an approximation as can be made to a *General Section* of the Coal Measures of the Warrior field in Jefferson county:

A General Section of the Strata above Drainage Level of the Coal Measures of the Warrior Field in Jefferson County.

Shale; massive and curly .... 75 ft. to 100 ft. 0 in.

(39) Coal .... 1 ft. to 1 ft. 6 in.

Sandstones; hard, shaly, gray, micaceous, fosiliferous. About .... 40 ft. 0 in.

(38) Coal; *guide seam*, soft .... 3 to 8 in.

Fire Clay .... 3 ft. to 4 ft. 0 in.

Sandstones, Shales. The sandstones are micaceous and of a gray color, and are in heavy boulders. They are reported to contain, locally at least, a little impure *carbonate of lime*. The shales contain, locally, *black band* and *clay iron stone* .... 100 ft. to 200 ft. 0 in.

(37) Coal; *Pratt seam*, from .... 2 ft. to 7 ft. 0 in.

Fire Clay .... 2 ft. to 10 ft. 0 in.

Sandstones, Shales, Clays; the sandstones are massive, micaceous and of a gray color; the shales and clays are arenaceous .... 20 ft. to 30 ft. 0 in.

(36) Coal; *fire clay seam*, good .... 1 ft. 4 in. to 2 ft. 6 in.

Fire Clay .... 1 ft. to 1 ft. 6 in.

Sandstones, Shales, Conglomerates; the shales are fosiliferous; the sandstones and conglomerates seem to be interchangeable. There is also reported to be here a seam about three feet thick of very hard black *bastard limestone*; if present at all, it is only local .... 25 to 40 ft. 0 in.

(35)
Coal .... 1 ft. to 2 ft. 0 in.
Clay, Slate; fosiliferous, with streaks of *coal* in places. 6 in. to 7 ft. 3 in.
Coal .... 1 ft. to 2 ft. 8 in.
Clay Slate; fosiliferous 0 to 1 ft. 9 in.
Coal; good .... 0 to 3 ft. 6 in.
Double Seam. 2 ft. 6 in. to 17 ft. 2 in.

Sandstones, Shales, Clay Slate; the sandstones are coarse grain, fosiliferous and of a gray color; the shales contain streaks of *coal* in certain localities .... 25 ft. to 175 ft. 0 in.

(34) Coal: very irregular, slaty and contains many balls of pyrites .... 1 ft. to 2 ft. 6 in.

Sandstones, Shales; the sandstones are hard, micaceous, slabby and flaggy, and of a dark gray color; the shales are argillaceous .... 30 to 70 ft. 0 in.

(33)
Coal .... 0 to 2 ft. 0 in.
Slate .... 0 to 0 ft. 4 in.
Coal .... 6 in. to 4 ft. 0 in.
Slate, Sandstone . 8 in. to 7 ft. 0 in.
Coal .... 3 in. to 1 ft. 8 in.
1 ft. 5 in. to 15 ft. 0 in.

Shales, Sandstones ; the shales are hard, massive, curly, siliceous and of a dark color; the sandstones are massive, flaggy and slabby .... 5 ft. to 50 ft. 0 in.

(32) Coal .... 1 ft. to 2 ft. 6 in.

Sandstones ,Shales; the sandstones are frequently very massive and coarse grained, and may be, in places, *conglomerates;* they are fossiliferous and contain thin streaks of *coal;* the shales are clayey, bluish and fosiliferous.20 ft. to 50 ft. 0 in.

(31) Coal .... 2 in. to 1 ft. 0 in.

Sandstones, *Shales.* The sandstones are massive and shaly, micaceous and fossiliferous, and of a dark gray color. The shales are argillaceous and fossiliferous and contain *clay iton stone* .... 25 ft. to 50 ft. 0 in.

(30) Coal; with slate partings .... 10 in. to 8 ft. 0 in.

Fire Clay .... 2 ft. 0 in.

Sandstones, *Shales;* the sandstones are hard, coarse grained. micaceous, fossiliferous, and of a grayish and bluish color. The shales are arenaceous and contain coal plants; they also contain, in some localities, *black-band* and *clay iron stone* .... 10 ft. to 50 ft 0 in.

Conglomerates .... 0 to 6 ft. 0 in.

(29) Coal; with a thin slate parting near the center.0 to 1 ft.0in.

Shales, *Sandstones*, Limestone; the shales are arenaceous and fossiliferous; the sandstones are massive, slabby, and shaly, micaceous and rippled marked, fossiliferous with shells and coal plants, and are of a dark gray color; the Limestone is hard and contain fossil shells, it is of a dark gray color and is in thin seams, not greater than three feet thick, in lower part of these sandstones and shales.50 ft. to 300 ft. 0 in.

Conglomerates .... 0 to 7 ft. 0 in.

Sandstones; micaceous and of a dark gray color.10 ft. 0 in.

(28) { Coal; with slate partings 2 ft. 4 in. to 9 ft. 6 in.
Sandstones, *Shales*, *Clays*; .... 0 to 12 ft. 0 in.
Coal; with slate partings........0 to 6 ft. 0 in. } Corona, Cal. Williams, etc. coal seam. 2 ft. 4 in. to 27 ft. 6 in.

Fire Clay. .... 3 ft. 0 in.

Sandstones, *Shales*; the sandstones are massive, slabby and shaly, hard and fine grained, micaceous and fossiliferous, and of a dark gray color; the shales are arenaceous and argillaceous, of a bluish color and have fossil coal plants and impressions of ferns. About .... 20 ft. 0 in.

(27) Coal .... 0 to 2 ft. 0 in.

Sandstones, *Shales;* the sandstones are massive, slabby and shaly, micaceous and rippled marked, and of a dark gray color; the shales are arenaceous and argillaceous, curly and fossiliferous, and of a bluish and an orange color .... 10 ft. to 50 ft. 0 in-

(26) Coal; with slate partings, Bailey, Bradley, etc., seam, Walker county .... 0 to 8 ft. 0 in.

Fire Clay.

Sandstones, CONGLOMERATES, *ShalesSlates*; the sandstones are soft, coarse grained and micaceous, bituminous and fosiliferous, and of a gray color; the *conglomerates* are about two feet thick; the shales are argillaceous and contain fossil coal plants; the slates are of a dark color and contain fossil coal plants. There is, in places, some thin streaks of coal near the top of these strata........ ....25 ft. to 50 ft. 0 in.

(25) COAL; only in places, thin. About............. .. 2 in.

Sandstones; contain some thin seams of *coal*, also some *clay iron stone* in the lower part. About ... .20 ft.-0 in.

(24) COAL.......... ....4 in. to 1 ft. 0 in.

Sandstones, Shales; the sandstones are flaggy and slabby; the shales are clayey and are of bluish and yellowish colors............ ... .25 ft. to 30 ft. 0 in.

(23) COAL; Baker's *upper bed* of Walker county.10 in.to 2 ft.0 in.

Fire Clay.

Shales, Sandstones; the shales are in places arenaceous and hard and of an orange color, and in other places are argillaceous and soft, and fossiliferous and of a bluish color; the sandstones are flaggy and slabby and are in seams in the shales.. .... 20 ft. to 50 ft. 0 in.

(22) COAL; in places, slaty throughout; in other places, only the upper six inches are slaty. Baker's *lower bed* of Walker county, *Freel's seam*, etc... .... 2 ft. to 6 ft. 0 in.

Shales, Sandstones; the shales are clayey and fosiliferous and are usually on weathering of an orange color, though they are sometimes bluish; the sandstones are massive and flaggy................. ....20 ft. to 40 ft. 0 in.

BLACK BAND.......... ....0 to 2 ft. 0 in.

Shale, Sandstone; like those over the *black band ore*.... .... 5 ft. to 20 ft. 0 in.

(21) COAL; with slate and clay partings. This coal is variable in thickness, texture and composition. *Jagger*, *Townley*, *Mt. Carmel; Hawthorne*, etc., beds of Walker county, the *New Castle coal seam* and the *Big vein* of Jefferson county........... ....5 ft. 0 in. to 14 ft. 0 in.

Sandstones, Shales; the sandstones are massive, slabby and shaly, hard and micaceous, and are of a gray color; the shales are fossiliferous and are of orange and bluish colors. Locally, there is considerably *clay iron stone* (*Kidney ore*) in the shales of the upper and lower parts of these strata......... ....15 ft to 60 ft. 0 in.

(20) COAL; poor, slaty....... .... 10 in. to 3 ft. 6 in.

Fire Clay........................... 1 ft. to 3 ft. 0 in.

Sandstones, Shales; the sandstones are massive, flaggy and slabby, hard and of a light gray color; the shales are clayey and fossiliferous..................10 ft. to 50 ft. 0 in.

(19) Coal; soft in places and hard and bony in some other places ....trace to 2 ft. 6 in.

Shales, Sandstones .... 15 ft. to 25 ft. 0 in.

Black Band ....0 to 1 ft. 4 in.

Sandstones, Shales; the sandstones in places are very massive and coarse grained, and is locally a *conglomerate* .... 15 ft. to 20 ft. 0 in.

(18) { Coal; soft..........0 to 2 ft. 9 in.
Fire Clay...........0 to 1 ft. 0 in.
Shales; argillaceous, fossiliferous ......0 to 12 ft. 0 in.
Coal; contains seams of pyrites and slate.0 to 4 ft. 9 in. } 0 to 21 ft. 6 in.

Shales, Sandstons; the shales are argillaceous and arenaceous; the arenaceous shales are *bituminous*; the sandstones are gray and hard...... ....20 ft. to 25 ft. 0 in.

Conglomerates; gray and hard, the pebbles are confined principally to the lower three feet............16 ft. to 40 ft. 0 in.

Slate.......................................0 to 1 ft. 0 in.

(17) Coal; bony ....1 ft. to 3 ft. 0 in.

Fire Clay......................................0 to 2 ft. 0 in.

Sandstone, Shales; the sandstones are hard, coarse and fine grained and micaceous, they are rippled marked and of orange and gray colors. The shales are arenaceous and argillaceous, and on the weathered surfaces are of an orange color. The sandstones contain some thin streaks of *coal* ....25 ft. to 125 ft. 0 in.

(16) Coal; *peacock* luster, very good and hard, has a thin parting of slate near the center .. ..4 in to 1 ft. 8 in.

Sandstones, Shales; the sandstones are fine grained and micaceous, and of a dark gray color. ....30 ft. to 50 ft. 0 in.

(15) { Coal; thin slate parting. 2 ft. to 4 ft. 0 in
Sandstones ... .0 to 9 ft. 0 in.
Coal....................0 to 1 ft. 6 in.
Sandstones ....0 to 4 ft. 0 in.
Coal; very good.........0 to 0 ft. 9 in. } **Jefferson Seam.** 2 ft. to 19 ft. 2 in.

Fire Clay............... .... 3 ft. 0 in

Sandstones, Shales; the sandstones are massive, flaggy and slabby, fine grained and hard, and of a gray color; the shales are argillaceous and of a bluish color, they contain fossil coal plants. ....20 ft. to 50 ft. 0 in.

(14) Coal; very uniform and good, consists of brighter and duller streaks. *The Black Creek Seam.* The common thickness is 2 feet 6 inches, though it is said to run up to 6 feet in one or two localities.................2 ft. 4 in. to 6 ft. 0 in.

Sandstones, Shales, Limestone; the sandstones are hard and micaceous, and of a dark gray color; the shales are clayey. The limestone is reported to be very sandy and to contain fossil shells; if present, it is only local...50 ft. to 140 ft. 0 in.

(13) COAL .... 0 to 1 ft. 0 in.

Sandstones, Shales; the sandstones are massive, flaggy and have *false beddings*; they are coarse grained and micaceous, and are of a gray color; the shales are arenaceous and argillaceous, and of a bluish color; they contain fossil shells, and man contain some thin seams of *coal*.....60 ft. to 225 ft. 0 in.

(12) COAL ....1 ft. to 1ft 2 in.

Sandstones, Shales .... 30 ft. to 125 ft. 0 in.

(11) Warrior Seam. 3 ft. 10 in. to 39 ft. 8 in.:

BLACK BAND, COAL; the black band in places becomes *coal*. 3 in. to 4 ft. 0 in.

Shale; hard, fossiliferous. 0 to 18 ft. 0 in.

COAL .... 1 ft. 0 in.

Shale ....3 in to 17 ft. 0 in

COAL ....2 ft. 4 in.

Fire Clay .... 4 ft. 0 in.

Sandstones, Shales ....16 ft to 20 ft. 0 in.

(10) COAL ....1 ft. 8 in. to 2 ft. 4 in.

Sandstones, Shales; the sandstones are micaceous; the shales are clayey and contain fossil coal plants, and are of a dark gray color.. 7 ft. 6 in.

(9) COAL; hard, *Nabers' seam* ....2 ft. 2 in.

Fire Clay; of a light color ....6 ft. 10 in.

Shales, Sandstones. Limestone; the shales are arenaceous and argillaceous and contain fossil coal plants, and are of dark gray and bluish colors; the sandstones are soft and hard, micaceous, and contain fossil shells and thin streaks of *coal*; the *limestone* is reported to be hard and bituminous, and of a dark gray color; if present, it is local ....295 ft. 6 in.

(8) COAL; hard and bright.................................. 1 ft. 6 in.

Fire Clay ....1 ft. 0 in.

Sandstones, Shales; the sandstones are hard and micaceous, and of a gray color; the shales are clayey. ....16 ft. 0 in.

(7) COAL...1 ft. 4 in.

Shales; with fossil coal plants ....12 ft. 0 in.

(6) COAL; said to be splendid ....2 ft. 6 in.

Sandstones, Shales; the sandstones are micaceous and of a gray color; the shales are arenaceous and argillaceous and micaceous .... 500 ft. 0 in.

(5) COAL; thin, about..6 in.

Shales, Sandstones; the sandstones are slabby.......35 ft. 0 in.

(4) COAL; about .... 1 ft. 0 in.

Shales; about...5 ft. 0 in.

CONGLOMERATES (upper conglomerate of Tennessee, etc.); the pebbles are small, and are in streaks and spots.
30 ft. to 50 ft. 0 in.

(3) COAL; about ....1 ft 0 in.

Shales, Sandstones; the sandstones are slabby and shaly, about ....50 ft. 0 in.

CONGLOMERATES (lower conglomerate of Tennessee, etc.); *mill-stone grit*, very massive and usually light colored and coarse grained, though not always so ....40 ft. to 75 ft. 0 in.
(2) COAL; about .. .. 1 ft. 0 in.
Shales; fossiliferous. ....3 ft. to 10 ft. 0 in.
(1) COAL; slaty, about. ....10 in.
Shales, *Sandstones*; the sandstones are slabby.30 ft. to 35 ft. 0 in.

SUB-CARBONIFEROUS STRATA.

DETAILS.

A detailed account of this *General Section*, or of that part of the Warrior coal field which is in Jefferson county, will now be given by commencing in the north-east portion of the county and coming down the trough to the south-west, by continually crossing and recrossing the trough in a zig-zag line, so as to take in the whole area. We shall speak of the outcrops seriatim, and, so far as we can, we shall refer the most important of these outcrops to their proper horizontal positions in the *General Section*, and shall give sections and analyses of the different coals.

As a rule, the coal measures of the north-east portion are thinner, or the surface rocks are lower in the series, than they are in any other portion of this area; the measures thickening or the surface rocks getting higher in the series, as we go down the trough or to the south-west.

At the south-west end of Brown's Valley or the great Sequatchie Valley of Tennessee, as a valley, some two miles north of the northern boundary line of this county, within the county of Blount, near Reid's Gap, on the South & North Alabama railroad, there is a natural exposure, about as follows:

Section near Reid's Gap on the South & North Alabama Railroad.

(6) CONGLOMERATES (upper); capping bluff, about..50 ft. 0 in.
(5) *Debris;* bench, doubtless covering shales and shaly rocks, with perhaps *coal seams* in the upper and lower parts, 60 ft. 0 in.
(4) CONGLOMERATE (lower); "*Millstone Grit*,"......50 ft. 0 in.

(3) COAL; (2) of the *General Section*, thought to be about ....1 ft. 0 in.

(2) *Sandstone. Shale, Debris;* about........ .. ...40 ft. 0 in.

(1) MOUNTAIN LIMESTONE.

Nos. (6) and (4) of this section are respectively the *upper* and *lower conglomerates* of Tennessee and other States.. These conglomerates, in places on the high points, in this immediate neighborhood are naked, without a vestige of vegetation, over areas almost acres in extent, and form bluffs along the edges of the ravines and the anticlinal valley. They appear to have a general dip of about 8° to 10° to the south-west and hence the *lower conglomerate* sinks below the drainage level before it gets to this county. The *upper conglomerate* is, however, the surface rock over the top of the anticlinal fold along the county line in the north-west portion of T. 14, R. 3 W. This anticlinal fold is the continuation, as a ridge, of the above anticlinal valley, which is known in Alabama as Brown's Valley and in Tennessee as the Sequatchie Valley. In these out-crops, this *upper conglomerate* is a broad flat rock, with its pebbles, which are usually small, well rounded and of a white color, principally confined to streaks and spots. These weathered out-crops are also, in places, very friable, and in some instances, when free from pebbles, are not much more than loose masses of beautifully white and red, coarse, sharp grains of sand, which glisten in the sun. Scattered over the surface, in many places around the out-crops of these conglomerates, as boulders from a few inches to several feet in diameter, there are hard rocks which are known to the country people as *cement rocks* and which are nothing more than detached pieces of ferruginous conglomerates from the lower part of these *upper conglomerates.* Over the surface, formed by the out-crops of these massive conglomerates, the growth is principally long-leaf pine. With the exception of a reported coal seam in Mr. Paris' well, in the S. W. ¼ of S. 7, T. 14, R. 3 W., there are no out-crops of coal known of hereabouts, or in this county north and west of the ravines near Warrior Station on the South & North Alabama railroad, in which are the mines of the *Hœne Warrior and Jef-*

ferson Coal Company and the *Pierce's Warrior Coal & Mining Co.* Along the Jasper and Warrior Station road, in the N. E. ¼ of S. 15, T. 14, R. 3 W., there are numerous chalybeate springs, which likely have their origin in the out-crops of one or more of the lower coal seams in the following section :

Section of Strata above Drainage Level just North of Warrior Station, in S. 12, *T.* 14, *R.* 3 *W.*

(12)	*Sandstone;* fossiliferous.	
(11)	Shale	10 ft. 0 in.
(10)	Coal; cropping out in railroad cut near Pierce's old shaft, (12) of the *General Section*	1 ft. 2 in.
(9)	*Sandstones*	30 ft. 0 in.
(8)	Black Band Iron Ore	2 ft. 4 in.
(7)	*Shales*	0 to 18 ft. 0 in.
(6)	Coal; *Warrior or Pierce's seam,* (11) of the *General Section*	2 ft. 10 in.
(5)	*Fire Clay, Sandstone*	20 ft. 0 in.
(4)	Coal; good, parting about one inch thick near the center, (10) of the *General Section*	1 ft. 10 in.
(3)	*Clay, Sandstone, Shale.*	8 ft. 0 in.
(2)	Coal; *Nabers' seam*; bluish black, (9) of the *General Section*	2 ft. 2 in.
(1)	*Shale, Sandstone.*	

In the S. W. ¼ of S. 14, T. 14, R. 3 W., there is an out-cropping of a seam of coal about two feet in thickness, which is believed to be identical with the *Nabers' seam,* (9) of the *General Section,* the lowest seam that crops out in this vicinity. The Nabers and Worthington old mine and the Gould old mine, both of which have long since been abandoned, were in this coal out-cropping. North of these old drifts, but in the same quarter section, along the Jasper and Warrior Station road, there are visible the out-crops of two seams of coal, which are about thirty feet apart and are likely of the *Warrior seam* and the one above it. North of these out-crops, or in the N. E. ¼ of S. 14, T. 14, R. 3 W., there are several old test holes which were dug by Mr. F. J. Muller, Secretary of the *Hœne Warrior and Jefferson Coal Company,* and in which there are exposed the out-crops of the Nabers' and Warrior coal seams, and the coal seam between them. The most south-western of these holes is in the out-crop of the Nabers' seam, and about 150 yards N E N. and east from this pit, there was dug into, respectively, the Warrior seam and the seam between the Nabers' and Warrior seam. About N. 20° E., also 150 yards, from the test hole into the intermediate seam, and on ground about thirty-five feet higher, there was exposed a seam of coal fourteen inches thick, which is doubtless the one just over the Warrior seam or (12) of the *General Section*. This last out-cropping of coal is nearly 175 feet below the top of the divide between it and the *Alabama mines* of the Hœne Warrior and Jefferson Coal Company. In the case of all of these coal out-crops which were exposed by Mr. Muller, there is no evidence of them on the surface, as they are covered deeply by debris, which had to be dug into several feet before the coal smut began to show itself.

The Hoene Warrior and Jefferson Coal Company own, near Warrior Station, 200 acres of coal lands, of which about 100 acres are well developed. Their *Alabama Mines* are located on this property, and consist of a series of drifts, in a deep ravine, in the N. E. ¼ of S. 14, T. 14, R. 3 W., on the west side of the S. & N. Ala. R. R., and some 175 feet below its level. These mines were opened about twelve years ago, and, for the year ending July 1, 1884, had an output of 31,661 tons of coal, and for the year ending July 1, 1885, an out-put of 27,461 tons. In July, 1885, they had a yearly capacity of from 33,000 to 35,000 tons of coal, and the company were then preparing to drive a series of new drifts, south of the old ones. The coal from these mines is pulled in cars, by steam, from near the mouths of the drifts, which are connected with the incline, up a steep incline to the general level of the country above, and thence, by horse power, over a tram-way, several hundred yards long, to the shoots on the S. & N. Ala. R. R. These drifts are in the out-crops of the coal seam, which is known as the *Warrior* or *Pierce seam*, (11) of the *General Section*, which here dips to the ESE. nearly 3 feet in 100 feet. This dip is so taken advantage of in mining as to secure a natural drainage.

The seam, however, is in billows or waves, and varies from about two feet to five feet in thickness. The following sections represent this coal seam at two different points in these mines:

Sections of Warrior Coal Seam in Alabama Mines, in the N. E. ¼ of S. 14, T. 14, R. 3 W.

		(1)	(2)
(9)	*Shale, Sandstone;* cover.		
(8)	Coal	6 in.	6 in.
(7)	Black Band Iron Ore	1 ft. 11 in.	1 ft. 10 in.
(6)	*Clay or Clayey Slate*	1 to 2 in.	0 ft. 0 in.
(5)	*Shale, Sandstone*	2 to 3 ft. 0 in.	0 ft. 0 in.
(4)	Coal	11 in.	8 in.
(3)	*Slate*	6 in.	4 in.
(2)	Coal	2 ft. 6 in.	2 ft. 3 in.
(1)	*Fire Clay;* underbed	4 to 5 ft. 0 in.	4 to 5 ft. 0 in.

Formerly, when the *black band iron ore* was immediately over the coal, without any intervening rocks, as in (2) of the above sections, it was sometimes mined. The interbedded rocks between this *black band iron ore* and the coal below, vary very much in thickness, though, in a general way, they, as well as the slate parting (3) of the above sections, seem to thicken in the direction of the dip, while the *black band iron ore* thins out or becomes more and more coaly in this same general direction. The coal from these mines has quite a reputation for steaming and domestic purposes, and is mostly consumed by the L. & N. R. R. Co., though some of it goes to Columbus, Ga.; Eufaula, Selma, Montgomery and Mobile, Ala., and New Orleans, La. The fire clay underbed is full of beautiful and rare impressions of coal plants.

In the out-crops of this same Warrior seam of coal on the east side of the S. & N. Ala. R. R., about three-fourths of a mile north of the above *Alabama Mines*, or in a ravine in the S. W. ¼ of S. 12, T. 14, R. 3 W., are the old drifts, which are known as the Pierce's "*old hollow mines.*" These "*old hollow mines*" were opened some fourteen years ago, on the completion of the S. & N. Ala. R. R., and were the first mines which were scientifically worked in the Warrior coal field. They consisted of a number of drifts, and had a daily out-put of between 100 and 150 tons of coal, but, as they were near the most north-western out-crops of this seam of coal, there was not a great deal of territory that could be mined from them with a natural drainage, and hence, as soon as this territory was worked out, they were abandoned. The coal in these drifts varied from 2 to 2½ feet in thickness, and had the *black band iron ore* immediately over it. Though considerably softer than the coal of the *Alabama Mines*, which was probably due to its thinner covering, it was of good quality for blacksmithing and steaming purposes, and was entirely consumed by the L. & N. R. R.

Going farther in on this coal or away from its north-west out-crops, Mr. Jas. T. Pierce sank a shaft down to it, by the side of the railroad, about half-way between the "old hollow mines" and Warrior Station. This shaft is known as the *old shaft*, and in it the coal and the overlying black band iron ore are said to be about similar to what they are in the *Alabama Mines*. The out-put of this shaft is now about 200 tons of coal per day.

Going still farther in on this same seam of coal, from its north-west out-croppings, Mr. Pierce reached it by an other shaft, that is called the *new shaft*, which was sunk near the school house, on the south-east side of the town of Warrior. He also drove drifts into its out-crops about one-fourth of a mile north-east of the town, in a ravine which is known as the *Wolf Den Hollow*. The out-crops in *Wolf Den Hollow* have about the following average section:

Section of Warrior Coal Seam, in "Wolf Den Hollow,"
in S. 13, *T.* 14, *R.* 3 *W.*

(5)	*Shale;* hard.	
(4)	COAL	10 in. to 1 ft. 0 in.
(3)	*Slate*	3 to 6 in.
(2)	COAL	2 ft. to 2 ft. 6 in.
(1)	*Fire Clay.*	

It will be observed that the *black band iron ore* does not occur in this section, but it is said to be here about twelve feet above the coal and to be about two feet thick. As these drifts are about the same distance from the railroad as those of the *Alabama Mines* and as they are similarly situated in a deep ravine, their coal is pulled up an incline and hauled on a tram-way to the shoots on the South & North Alabama Railroad, just opposite to those of the *Alabama Mines*, in the same way as is the coal of the *Alabama Mines*. The following is a reported section by Mr. James T. Peirce, of his *new shaft*, near the school house, and a bored hole in the bottom of this shaft:

Section of Pierce's "New Shaft," at Warrior Station.

(9)	*Shale, Sandstone*; doubtless contains the coal (11) of the *General Section*	144 ft. 0 in.
(8)	Coal; red ash, believed by Mr. Pierce to be the seam of the *black band iron ore*	2 ft. 0 in.
(7)	*Shale*	18 ft. 0 in.
(6)	Coal; believed by Mr. Pierce to be the coal above the parting in the *Warrior seam*	1 ft. 0 in.
(5)	*Shale*	16 ft. 0 in.
(4)	Coal; believed to be the *lower coal* of the *Warrior seam*; bottom of shaft	2 ft. 4 in.
(3)	*Fire Clay*	4 ft. 0 in.
(2)	*Sandstone*	16 ft. 0 in.
(1)	Coal; bottom of bored hole	2 ft. 4 in.

The daily out-put of this *new shaft* is now one hundred tons of coal. The combined out-put of the Pierce's Warrior Coal Company Mines, which consist of the *Old Shaft, the Drifts of Wolf Den Hollow* and the *New Shaft*, is therefore now six hundred tons of coal per day.

If the first of the above suppositions is true, viz: That (8) of the section of the *new shaft* is identical with the *black band iron ore* over the Warrior seam, then there is no doubt but that (6) and (4) of that section are respectively the *upper* and *lower parts* of the Warrior seam. We believe the above suppositions to be true and that the lower part, (4) of the above section, of the Warrior seam is here in its proper-horizontal position, while (6) and (8) are respectively sixteen feet and thirty-four feet out of or above their proper levels. They seem to have risen respectively these distances in one-fourth of a mile to the south-east; for, in a bored hole one-fourth of a mile north-west of this *new shaft*, they are said to have been all together and to have had a combined thickness of five feet four inches. This split in the Warrior seam is believed to take place along a line running north-east and south-west between the depot and the "Kaley House," Warrior Station. As neither the *Warrior seam* nor any of the above parts of it show again in this portion of the Warrior coal field south-west of here, from, we believe, the presence of a cross fault just south of Warrior Station, along which there is a down-throw of the south-west side, and as this Warrior seam has never been worked nor developed in any other part of the Warrior coal field, we can not say where these *splits* come together, though we are confident that they do.

In a shallow cut on the South & North Alabama Railroad about on a line between the *Alabama Mines* and the *Wolf Den Hollow Mines*, there is a thin showing of coal, and in the sides of a cut, about twenty-five feet deep, just south of Pierce's *old shaft*, the rocks are cut up by regular parallel perpendicular planes of division, running north-east and south-west, and from three to four feet apart, which extend and are visible through the whole depth of the cut. In the Blount Springs road, on the opposite side of the ridge north of Pierce's *old hollow mines* and some forty to fifty feet below its top, there is an out-cropping of the Warrior coal seam along its most north-western limits. North of this out-crop, or between it and the out-crops of the *upper and lower conglomerates* near Reid's Gap, there is a thick development of sandstones and shales, which, so far as is known, are barren of any visible coal, though doubtless they do contain more or less of the coals from (1) to (10), inclusive, of the *General Section.*

In the out-crops of this same *Warrior seam*, on Hogan's Creek, in the S. W. ¼ of S. 17, T. 1[illegible], R. 2 W., are the *Warrior Coal and Coke Company Mines.* These mines, in July, 1885, consisted of three drifts, and had a monthly out-put of about 6,000 tons and a monthly capacity of about 7,500 tons of coal, and the company were intending then to double this capacity by driving new drifts on the opposite side of the ridge. The three drifts are some forty feet below the top of the ridge and fifty to sixty feet above Hogan's Creek. The coal cars are pulled by mules from out of the mines to the shoot, on a branch railroad which runs along the bank of the creek below the mouth of the drifts. This wide guage branch railroad leaves the South & North Ala. Railroad about two miles north of Warrior Station and is between three and four miles long. The coal seam in these mines has a dip of about two feet in one hundred feet to the south-east, which is so taken advantage of in mining as to secure a natural drainage. The coal is somewhat variable in thickness, reaching in places as great a thickness as three feet and seven inches, though the parting remains always about the same. The following section represent the extremes of a half-dozen sections of this coal seam in these mines :

Section of Warrior Coal Seam in " Warrior Coal and Coke Company" Mines,
in S. W. ¼ of S. 17, T. 14, R. 2 W.

(5)	*Shale*, cover.	
(4)	COAL	6 to 9 in
(3)	*Clay*	½ to 2 in.
(2)	COAL	2 ft to 2 ft. 6 in.
(1)	*Fire Clay*; underbed.	

The *black band iron ore* in the out-crops at these mines, is reported to be some ten feet above the coal and to be only three to four inches thick and to have a thin sheet of coal over it.

In *Drift No.* 1 of these mines, there was visible about two feet of a fossil trunk of a tree, about one foot seven inches in diameter, standing perpendicular, with its butt end resting on the coal and its upper end extending up into the roof. This coal is comparatively soft and friable ; it cokes well. The out-put is used mostly for steaming purposes on the Louisville & Nashville Railroad and other railroads, and in the cities of Montgomery and Mobile, Alabama. The following analyses, made by Prof. Lupton, then of Vanderbilt University, Nashville, Tennessee, now of the A. & M. College, Alabama, will show the quality of the coal from these mines and its coke:

COAL.		COKE.	
Fixed Carbon	65.12	Moisture	2.55.
Volatile Matter	32.24	Carbon	93.86.
Ash	1.27	Ash	2.98.
Sulphur	.56	Sulphur	.61.

On the opposite or south-side of the creek, or ravine, from these drifts, the coal in the out-crops of this same seam is said to be of a *peacock* color and to be several inches thicker than in the coal seam in the present mines; it is also, from the south-east dip, lower, and hence has a thicker and better covering. This coal seam also shows in several out-crops, which were formerly surface worked, higher up Hogan's Creek than the Warrior Coal and Coke Company Drifts.

Up the river, and in the river, and east of the Warrior Coal and Coke Company mines, or in Blount county, in S. 25, T. 13, R. 2 W., there is said to be an out-cropping of coal three feet four inches thick, and east of these mines, across the river, on Gurley's Creek, in the neighborhood of Smith's mill in the N. E. ¼ of N. E. ¼ of S. 23, T. 14, R. 2 W., there are said to be the out-croppings of three good seams of coal. In the road, at the mill, there is a showing of about twelve inches of coal smut with a clay underbed, and in the creek about a half-mile above the mill, there is a reported out-cropping of coal, four feet four inches thick, without any partings. In S. 12, T. 14, R. 2 W., there is said to be an out-cropping of coal five feet seven inches thick; in S. 2, T. 14, R. 2 W., one three feet four inches thick, and in S. 16, T. 4, R. 1 W., an other one three feet four inches thick. These coal seams are necessarily low down in the measures, and are probably of the seams from (6) to (8), inclusive, of the *General Section*.

The *Warrior coal seam* is believed by some to be confined to the locality around Warrior Station, though this is not the case as we have recognized it in its full thickness at several other widely separated localities in the Warrior coal field. All of its known out-crops around Warrior Station are on the north-west side of the synclinal trough. The lowest strata above drainage level just south of the town, are much higher in the measures than the Warrior coal seam or than can be accounted for by the dip alone, hence the supposition, though no other evidences were seen of it, that a cross-fault or a fault which runs north-west and south-east and along which there has been a down throw of the south-west side, occurs just south of Warrior Station. Along the old Stout road, in the S. W. ¼ of S. W. ¼ of S. 14, T. 14, R. 3 W., on the south-west side of this supposed fault, there is an out-cropping of the conglomerate between (17) and (18) of the *General Section*, and of the coal (16) of the *General Section.* This conglomerate also caps the high bluff above the *Watts Coal, Coke and Iron Company Mines*, on the west bank of the river (Locust Fork) in the S. E. ¼ of S. 27, T. 14, R. 3 W. The Watts Coal, Coke and Iron Company is said to own some twelve thousand acres of land here in one body, on the west side of the South & North Alabama railroad and about equally divided by the river, on which there are exposed, so it is said, above drainage level, all of the coals from (11) to (21), inclusive, of the *General Section.* Their mines are well ventilated, and at present consist of three drifts, which are to be increased as the demand requires. They are on the immediate west bank of the river, in the out-crop of the *Jefferson coal seam*, (15) of the *General Section*, which, here at these drifts, is some thirty-five feet above low water in the river, though it is said to run into the water about a half mile lower down the river. These drifts were opened in November, 1884, and in July, 1885, they had a daily out-put of something over 100 tons of coal, or a monthly capacity of about 4,000 tons of coal.

The company employs over 100 men, of whom the miners are partly free laborers and partly convicts. The coal cars are pulled out of the mines to the foot of the incline, near the mouths of the drifts, by mules, and thence by steam up the very steep incline to the shoot, which is about 150 feet in a perpendicular line above the drift, where the coal is immediately dumped into cars standing on a broad-gauge branch road, with steel rails, about one and three-quarter miles long, that leaves the South & North Alabama Railroad about three-fourths of a mile south of Warrior Station at Watts' Junction. The seam of coal in these mines is in waves which run from north-west to south-east, and are about sixty feet long from top of crest to top of crest, and one foot deep from top of crest to bottom of trough. The general dip of the seam is, however, a little more than one degree to the south-east, which enables the mines to be kept dry by natural drainage. The coal is somewhat variable in thickness, as, on top of some of the crests of the waves, it thins down to as little as fourteen inches, while in the troughs it sometimes thickens out to as much as four feet; it will average however about three feet in thickness. The seam of coal in these mines is different from most of the other coal seams that have been examined, which are irregular, in that the thickening and thinning of the coal, respectively, in the bottoms and on the crests of the waves, take place in the bottom of the seam rather than in the top, as is generally the case. The following sections were taken at two different points in these mines:

Sections of Coal Seam in "Watts' Coal, Coke and Iron Company" Mines, in the S. E. ¼ of S. 27, T. 14, R. 3 W.

		(1)	(2)
(9)	*Sandstone.*		
(8)	*Shale*	3 ft. 0 in.	3 ft. 6 in.
(7)	*Pyrites*	0 0	1 in.
(6)	COAL	8 in.	9 in.
(5)	*Rash, Slate*	2 in.	¼ in.
(4)	COAL	1 ft. 2 in.	1 ft. 4 in.
(3)	*Rash, Clayey Slate*	1 in.	2 in.
(2)	COAL	7 in.	9 in.
(1)	*Fire Clay;* underbed.		

The coal from these mines is sold principally for steaming and blacksmithing purposes, though it is well adapted to grate and coking uses. The following card explains itself:

LOUISVILLE & NASHVILLE R. R. Co.,
(Office of Superintendent.)
Second Division Main Line; Nashville & Decatur Division;
Henderson Division, and Nashville
& Florence Railroad,
Nashville, Tenn., June 27, 1885.

Watts Coal, Coke & Irom Company; Warrior, Ala :

On our request you furnished us a car-load of the Watts coal, to be tested for blacksmith use. It gave great satisfaction, being pronounced by our men a very superior coal for blacksmith purposes, and it is probable we will use it in our shops here.

Yours truly,
JAMES GEDDES, Sup't.

The following is a reported test under stationary boilers:

NAMES OF COALS.	Pounds of water evaporated per lb. of coal.	Per cent. of residuum.	Relative evaporative values.
Pittsburg coal, screened...	8.17	12.80	100.00
Watts coal, run of the mines.	8.16	14.60	99.90

The following is a reported analysis of an average sample of coal from these mines:

Moisture	1.611
Volatile matter	33.004
Fixed carbon	61.785
Ash	2.488
Sulphur	1.112
	100.000

The "Sloss Furnace Company," of Birmingham, coked several car loads of this coal and pronounced it to be an excellent coking coal. A number of coke ovens are going to be erected near the chute. The principal markets for the coal from these mines are the Louisville & Nashville Railroad, and the cities of Nashville, Tennessee; Mobile and Montgomery, Alabama; Pensacola, Florida, and New Orleans, Louisiana.

In a ravine, about one-fourth of a mile north-west of the present drifts of the Watts Coal, Coke and Iron Company, there is said to be an out-cropping of the next underlying coal seam, (14) of the *General Section*, which is the well known *Black Creek coal seam.* This coal seam it is reported, will be worked from the above out-cropping by the Watts Coal, Coke and Iron Company, who will bring its coal through their present Drift No. 3 and up their present incline. Along this incline, the coals (16) and (17 of the *General Section,* are hid by debris, but the conglomerate just over (17) of the *General Section,* shows as a prominent ledge, from eighteen feet to twenty feet thick.

Up the branch railroad some three-fourths of a mile from the coal shoot of the Watts Coal, Coke and Iron Company Mines, near the crossing of the old Stout road, there is on the north side of the branch railroad, scattered over the side of a ridge, a great many *Knox chert pebbles*, and, on top of this ridge, a great deal of loose ferruginous conglomerate which contains these cherty pebbles. These pebbles are not entirely rounded, though their edges are well worn and smooth. On the north or opposite side of the railroad from this ridge, in the old Stout road and in an old field, there are the out-croppings of two seams of coal which are probably of (18) and (19) of the *General Section.* Where this branch railroad leaves the South & North Alabama Railroad, there is a showing of about twelve inches of coal smut, probably of (18) of the *General Section.* Just east of this last coal out-cropping on the east side of the South & North Alabama Railroad, there is scattered over the surface considerable conglomerate, in small loose pieces, which doubtless comes from that just over (17) of the *General Section.* This same conglomerate crops out on the side of the South & North Alabama Railroad about one-quarter of a mile south of where the above branch road leaves the main track, on the side of the ravine leading down from

Mr. W. D. Read's spring. Still farther down the railroad, about one-quarter of a mile, is the Brake Depot and Post Office, at the *J. Brake Coal Company Mines.*

These *J. Brake Coal Company Mines* are a hundred or so yards east of the railroad in the S. E. ¼ of S. 26, T. 14, R. 3 W., and consist of one slope down on the same coal seam as are the drifts of the Watts Coal, Coke and Iron Company, or on the Jefferson seam, (15) of the *General Section.* The mouth of this slope is at the bottom of a ravine which is about one hundred feet below the general level of the country above and about fifty feet perpendicularly above the foot of the slope or the Jefferson coal seam. This slope or mine had an out-put of 11,884 tons of coal for the year ending July 1st, 1885, and about two per cent. less for the previous year. In July, 1885, it had a capacity of about two hundred tons of coal per day and the above comparatively small annual out-puts are said to have been due principally to strikes. The coal cars are pulled in the mines to the bottom of the slope by mules and thence they are hoisted up the slope and incline by steam, to the scales on top of the shoot, from which the coal is immediately dumped into the Louisville & Nashville Railroad cars standing on a short branch track. The seam of coal in these mines has a general dip of about twenty-five feet to the mile or of 2° to 3° to S. 2° to 3° W., which is taken advantage of to drain the mines to a cistern or pool, at the foot of the slope, from which the water of the mines is pumped out by steam. As in the Watts Coal, Coke and Iron Company Mines, this coal seam is in waves, though the waves are larger in this mine. These waves run almost north and south, or about with the dip, and are some one hundred feet long from top of crest to top of crest and about three feet deep from top of crest to bottom of trough. The following two sections represent this seam of coal at two different points in these mines:

Sections of Jefferson Coal Seam, in "J. Brake Coal Company" Mines, in the S. E. ¼ of S. 26, T. 14, R. 3 W.

		(1)	(2)
(7)	*Shale;* hard, black, fossiliferous.		
(6)	COAL; good and hard	9 in.	1 ft. 0 in.
(5)	*Rash*; slate with thin sheets of coal.	3 in.	1 in.
(4)	COAL; good	1 ft. 6 in.	1 ft. 8 in.
(3)	*Slate;* clayey	8 in.	8 in.
(2)	COAL	1 ft. 0 in.	11 in.
(1)	*Fire Clay;* full of fossil steams.		

The coal from this mine is known principally as a steam coal and the entire out-puts for the last two years have been taken by the Louisville & Nashville Railroad under yearly contracts, though in former years some little of it was shipped to Montgomery, Alabama. In the slope, some thirty feet perpendicularly above the *Jefferson seam*, with hard dark siliceous shale between, and some twenty feet below the mouth of the slope, there is an out-cropping of the coal seam (16) of the *General Section*, as follows:

Section of Coal Seam Cropping Out in "J. Brake Coal Company" Slope.

(5)	*Shale*; hard, dark, good roof.	
(4)	COAL	10 in.
(3)	*Slate*	1 to 2 in.
(2)	COAL	10 in.
(1)	*Shale;* hard, dark.	

The coal seam, (17) of the *General Section*, just above this one, ought to crop-out along the incline at this mine, and doubtless does, but it is covered by debris. In the cuts along the South & North Alabama Railroad, between this mine and the bridge over the Locust Fork of the Warrior River, about one-half of a mile south of the Brake Mines Depot, there are out-crops of coal smut from four to five feet in thickness of the slaty seam, (18) of the *General Section*, and near the tops of the river banks, on both sides, at the bridge, the conglomerate just under (18) of the *General*

Section, again makes its appearance. The river here at the crossing of the South & North Alabama Railroad is not far from the central or bottom part of the great synclinal trough. In the river above the railroad bridge, there is said to be an out-cropping of coal which is doubtless of the Black Creek seam, (14) of the *General Section.* From this coal out-cropping in the river much coal is said to have been raised in ante-railroad times in Alabama, during low stages of the water, and loaded in flat boats which were tied up and made ready to be floated down to Tuscaloosa and Mobile at the first freshet. The coal seam next above this Black Creek seam or the *Jefferson coal seam*, of the Watts Coal, Coke and Iron Company Mines and J. Brake Coal Company Mines, crops out in the banks of the river in S. 36, T. 14, R. 3 W., or about one-quarter of a mile south of the bridge or up the river from the bridge. This coal out-crop in the southern bank of the river was entered and worked for a short while by a slope, which commenced about seventy-five feet below the level of the railroad track; but, as the mouth of this slope was below the high water mark, it was abandoned, in 1875, to sink the present shaft at the *Jefferson Mines.* Below the railroad bridge, or at Brake's ford, the crossing of the river by the old Stout road, there crops out in the road, on both sides of the river, the conglomerate just under (18) of the *General Section*, with coal smut showing on the north side of the river from the coal seam above the conglomerate or (18) of the *General Section*, and on the south side of the river, from the coal seam below the conglomerate or (17) of the *General Section.* In this road, on the north side of the river, there are to be seen some beautiful effects of the weathering of the above hard conglomerates and sandstones, just under (18) of the *General Section.* These rocks, in this out-crop, appear as strata of nothing more than loosely coherent coarse grains of sand, which, in places, is streaked or something like a striped formation. In the cuts along the South & North Alabama Railroad from the bridge to the *Jefferson Mines* of the Hœne, Warrior and Jefferson Coal Company, about one-quarter of a mile south of the bridge, the rocks just under

(18) of the *General Section* crop out as hard shales with interbeded seams of sandstones, from four to five feet thick, which form prominent ledges, every ten to twelve feet apart. These rocks are very near level, though they have a slight dip to the north-west.

The *Jefferson Mines* of the Hoene Warrior and Jefferson Coal Company consist of one shaft about two hundred feet deep, about one hundred yards east of the South and North Alabama Railroad. This shaft commences in a stratum near (18) of the *General Section* and extends down, through all intermediate strata to the fire clay underbed of (14) of the *General Section.* The following section of this shaft is a combination of the section given by the State Geologist in his report for 1879, on page 69, and notes of personal observations :

Section of Shaft at "Jefferson Mines,"
of the Hœne, Warrior and Jefferson Coal Company,
in the N. W. ¼ of S. 36, T. 14, R. 3 W.

(13)	COAL; full of slate, (18) of the *General Section*	4 ft. 9 in.
(12)	*Shales, Sandstones*	21 ft. 1 in.
(11)	CONGLOMERATE	16 ft 0 in.
(10)	*Slate*	1 ft. 0 in.
(9)	COAL: shaly, (17) of the *General Section*	1 ft. 6 in.
(8)	*Sandstones, Shales*	81 ft. 0 in.
(7)	COAL; clay parting near the center, (16) of the *Generl Section*	1 ft. 6 in.
(6)	*Shales, Sandstones*	40 ft. 6 in.
(5)	COAL; with two partings, *Jefferson seam*	3 tf. 3 in.
(4)	*Fire Clay*	2 ft. 0 in.
(3)	*Shales, Sandstones*	29 ft. 5 in.
(2)	COAL; variable, *Black Creek seam*	2 ft. 6 in.
(1)	*Fire Clay*	4 ft. 0 in.

The *Black Creek Coal* seam, at the bottom of this shaft, was formerly worked from this shaft, but it became so much squeezed out or so irregular that it could not be profitably worked and hence it was abandoned some eighteen months ago or in 1884, for the *Jefferson Coal seam,* some thirty feet above it, which had been previously worked, from this same shaft, and had been given up for the Black Creek seam. With the exception of in these mines, the *Black Creek coal seam*, in the very many places in which it has been examined, has been especially noted for its remarkable uniformity of thickness and composition. Its common thickness in these mines is from two feet to two feet six inches, though it varies from fourteen inches to four feet six inches. It is an eminently pure coal and has no partings whatever. Its outcrop in the river above the railroad bridge, and in the ravine near the Watts Coal, Coke and Iron Company drifts, and its occurrence in this shaft, are the most north-eastern points at which this *Black Creek coal seam* has been tested or seen. The *Jefferson coal seam* of this shaft, which, as has been stated, was worked previously to the Black Creek seam and had been abandoned for that seam, was opened up again some eighteen months ago or in 1884, and in addition to the great work of cleaning and repairing the mines, after several years of neglect, and of development, in the driving of new entries, etc., it yielded, for the the year ending July 1st, 1885, 1,363 tons of coal, and, at the rate of out-put for the last four months, would have an annual out-put of 36,000 tons of coal. There are employed at these mines, from fifty to seventy-five men. The following section represents the extremes of several sections of the Jefferson coal seam in these mines:

Section of "Jefferson Coal Seam" in Jefferson Mines of the Hœne Warrior and Jefferson Coal Company, in N. W. ¼ of S. 36, T. 14, R. 3 W.

(7)	*Shale;* cover.	
(6)	COAL	0 ft. 6 to 10 in.
(5)	*Rash;* slaty coal	0 ft. 3 to 4 in.
(4)	COAL	1 ft. to 1 ft. 2 in.
(3)	*Rash*; very slaty coal	0 ft. 6 in.
(2)	COAL	0 ft. 4 to 8 in.
(1)	*Fire Clay;* underbed.	

The uses and markets of the coal from these mines are about the same as those of the coal from the *Alabama Mines*.

The strata in the *Jefferson Mines* are nearly level, though they seemingly have a very slight dip almost due south, perhaps to a little east of south.

The combined out-put of the Hœne Warrior and Jefferson Coal Company or of the *Alabama* and *Jefferson Mines* is therefore now over 70,000 tons of coal per annum.

The coal seam seen in the slope of the J. Brake Coal Company Mines, also crops out in the shaft of the Jefferson mines, where it is about eighteen inches thick and has its central parting of slate. This seam is also said to crop out, and to have been formerly surface worked, on *Lick Branch*, east of the Jefferson mines about three-quarters of a mile. By the side of a wagon road, just north of Morris Station, and east of the railroad, there is an out-cropping of a thick seam of coal which is likely the slaty seam, (18) of the *General Section.* The State Geologist in his report of progress for the year 1875 gives on page 72 the section of a drilling, over 411 feet deep, for coal at Morris Station. This drilling commences in a stratum under (21) of the *General Section* and ends in a stratum between (13) and (14) of the *General Section.*

Along Turkey Creek, about one-half mile south-west of Morris Station, there are several out-croppings of coal which are of (18) of the *General Section,* split up into two or more parts. In one of these out-crops however, there appears to be above the coal a conglomerate which we have seen, as such, no where else in the Warrior field. In a hollow in the S. E. ¼ of S. E. ¼ of S. 11, T. 15, R. 3 W., this coal crops out as two seams about twelve feet apart. The upper one of these out-crops appears to be about two feet nine inches thick and has a thin parting of slate about four inches from the bottom; the lower out-crop is about three feet in thickness. South of these out-crops some three hundred yards, immediately on Turkey Creek, and some ten feet above low water in the creek, there is an out-cropping which shows about three feet four inches of coal, with a thin parting of slate about four inches from the top. Some ten feet above this coal is the conglomerate of which we have just spoken or the conglomerate just over (18) of the *General Section;*

and, some seventy-five yards up the creek, there is an other coal out-cropping which shows to a thickness of about two feet and has a thin slate parting about six inches from the bottom. In the bed of the creek, under this last coal about four feet, there is said to be an other out-cropping of coal. This coal in the creek and that four feet above it are, without a doubt, parts of the slaty seam, (18) of the *General Section,* and if the other coal out-cropping, seventy-five yards farther down the creek, is not of the same seam, it is because there is a fault between the two out-crops.

Higher up Turkey Creek, in a field just east of the old Stout road, there was seen some loose pieces of coal and *black band iron ore,* which very likely came from respectively (19) and the black-band between (18) and (19) of the *General Section.* Still higher up the creek, about three-fourths of a mile above the coal spoken of in the creek, there is the following out-crop, which is believed to be of (30) of the *General Section,* though it may be of a lower seam:

Section of Coal Out-Crop on Turkey Creek, in the S. E ¼ of N. W. ¼ of S. 13, T. 15, R. 3 W.

(8)	*Slate.*	
(7)	COAL	8 in.
(6)	*Slate*	½ in.
(5)	COAL	5 in.
(4)	*Slate*	½ in.
(3)	COAL	11 in.
(2)	*Slate*	⅛ in.
(1)	COAL	1 ft. 3 in.

The country to the south-west of Turkey Creek is elevated from 200 to 300 feet above the creek, and is seemingly made up, above drainage level, principally of hard shales, with some sandstones near the top. These rocks may be higher in the series than those on the opposite side of Turkey Creek, and, if so, they are of a down-throw along a cross-fault, or a fault running north-west and south-east, not far from Turkey Creek.

On Flat Creek, in the S. W. ¼ of S. W. ¼ of S. 17, T. 15, R. 2 W., there is a reported out-crop of coal under a bluff, and in the road in front of Mr. David Gillespie's house, in the S. E. ¼ of S. 17, T. 15, R. 2 W., and several hundred yards north-west of his house, there are showings of coal smut. The smut in front of Mr. Gillespie's house appears to be about two feet thick and to have a clay underbed. These out-crops are on the south-east side of the basin or trough.

Not very far from the south-east border of the Warrior coal field or the edge of the anticlinal valley, in Turkey Creek in the N. W. ¼ of S. 24, T. 15, R. 2 W., there is a reported outcropping of coal about twelve inches thick, which must be comparatively low down in the measures or not much above the *upper conglomerate* near the base of the measures. Along the public road, as it passes over *the mountain* or the elevated south-east rim of the coal measures, just above where Turkey Creek cuts through it, or in the S. W. ¼ of S. W. ¼ of S. 19, T. 15, R. 1 W., there are fine exposures of the two conglomerates near the base of the coal measures, or of the *upper and lower conglomerates* of Tennessee and other States. In these out-crops the *lower conglomerate*, known as *millstone grit*, is about sixty feet thick, and the *upper conglomerate*, which is here the capping-rock to the elevated south-east rim, is some thirty feet thick. These conglomerates, at this point, are some fifty feet apart, with the intermediate softer strata, which doubtless consist principally of shales, covered almost completely by debris. Under the *lower conglomerate*, or the *millstone grit*, there appeared to be here near 150 feet of strata, which also were almost completely covered by debris of the coal measures, and doubtless, if of the coal measures, they consist principally of shales. These shales between the conglomerates and under the *lower conglomerate*, are the great repository of the coals of Tennessee and other States, and in other parts of Alabama are more or less rich in coal, hence, though they may not have here any workable coal, they, more than likely, have some thin strata of coals or other evidences of some of the coal seams which they have elsewhere. The next bedded rocks, under those of the Coal Measures, which were seen in passing into the anticlinal valley along this road, were *Lower Silurian rocks*, though, between these rocks and the loose rocks of the coal measures, there was some debris, which may hide either a fault or sub-carboniferous rocks, or both. If there is no fault here, the sub-carboniferous rocks are much thinner than they are in North Alabama.

The out-crops of coal along this portion of the south-east edge of the Warrior coal field must be deeply covered by debris, as they show themselves in but very few places. After following down this south-east edge to the south-west some six miles, we find ourselves in the neighborhood of the numerous coal out-crops around New Castle, on the South & North Alabama Railroad, some ten miles north of Birmingham. Here, at New Castle, are located the mines of the *Milner Coal and Railroad Company*, successor to the *New Castle Coal and Iron Company.*

The Milner Coal and Railroad Company have a capital stock of $200,000, and own near New Castle a body of 2,000 acres of coal lands. The mines at New Castle were opened in 1874 by the New Castle Coal and Iron Company and worked by this company until 1881, when they were absorbed by the Milner Coal and Railroad Company. There are now worked here at these mines about 200 laborers, of whom about 150 are State and county convicts.

The successful opening of these mines, and the continued prosperity of the New Castle Coal and Iron Company and its successor, the Milner Coal and Railroad Company, have been due to the labors and wisdom of that *master-head* and genial gentleman, Col. Jno. T. Milner, President.

Here, at New Castle, are to be seen a vertical section of the strata, in the out-crops, of from 600 to 800 feet, of which from (14) to (20), inclusive, of the *General Section* are exposed along the incline. Sections of these strata, and descriptions of them and the mines, have been given by the State Geologist in his reports of progress for 1875 and 1877–78. The first coal seam opened up and worked at New Castle was the thick seam (21) of the *General Section*, and hence it has received the name of the *New Castle seam.* In the weathered out-crop at the mouth of one of the old drifts at these mines, this seam of coal shows about as follows:

Out-Cropping of "New Castle Seam" at New Castle, on the S. S. & N. Ala. R. R., in S. E. ¼ of S. 8, T. 16, R. 2 W.

(10)	*Shale.*	
(9)	Coal	11 in.
(8)	*Slate*	1 in.
(7)	Coal	1 ft. 1 in.
(6)	*Slate*	3 in.
(5)	Coal	6 in.
(4)	*Slate*	3 in.
(3)	Coal	2 in.
(2)	*Slate*	½ in.
(1)	Coal; thought to be about 2 feet 6 inches, visible	2 ft. 0 in.

This is commonly a firm, bright and free burning coal, which usually breaks but little on handling; it is always a good coal and is said to be frequently a superior coal for coking, blacksmithing and steaming purposes. 1,120 bushels of it is said to have run a locomotive 4,500 miles. It is not so thick, and is seemingly not so good here at New Castle as in other parts of the Warrior coal field, though the exclusive use of it from these mines on locomotives for years, and the following analysis of an average sample of the seam at these mines, by Dr. Otto Wuth, of Pennsylvania, and the following letter of that great iron manufacturer, Mr. James Noble, Sr., will show that it is here at New Castle of an excellent grade of coal:

Analysis of the Coal of the "New Castle Seam," at New Castle, by Dr. Otto Wuth of Pennsylvania.

Specific Gravity	1.38
Water	50
Volatile Matter	28.24
Fixed Carbon	59.69
Ash	10.92
Sulphur	46
	99.99

LETTER OF MR. JAMES NOBLE, SR.:

ROME, GA., April 20th, 1874.

John T. Milner, Esq.:

SIR:—Of the sixteen car loads of your coal sent us, two were turned over to Noble Bro. & Co., and used in our machine shop and foundry. Nine more have been used by us in the rolling mill at this place. The coal answers all of our purposes well, and is equal to, if not superior to, any coal used by us for heating or steam purposes. We prefer your coal to any we have been using.

Very respectfully,
JAMES NOBLE, SR.,
Supt. R. I. M. Co.

This seam of coal covers in this county between 450 and 500 square miles, and though it will average, here at New Castle, nearly six feet in thickness, and though its coal is of excellent quality, and though it was worked successfully for a number of years, it was finally abandoned on account of its slate partings for the lower and thinner, and purer, Black Creek seam, which will average only from thirty-two to thirty-three inches in thickness. This Black Creek coal is, however, of very uniform thicknes and composition, and is of the very best quality, and is entirely free from all slate partings. It is now being worked here at New Castle in one drift with an out-put of about 200 tons of coal per day. The seam on the out-crop has a dip of 25° to 30° to the north-west, though it soon flattens as gone into to a dip of only 4° to 5°. The drift is driven in the direction of the dip and the coal cars are hoisted by means of steam out of the mines and ravine, and thence pulled by mules along a tramway 1200 yards long to the scales and shoot on the South and North Alabama Railroad. There is, however, in course of construction an elbow track from the South and North Alabama Railroad to the mouth of the drift, which will do away with the tramway and most of the hoisting apparatus. This Black Creek coal seam not only covers a greater area of workable thickness than any other workable coal seam in Alabama, but its coal is also more universally pure and of more uniform thickness and composition than any other coal seam in the State. It covers over 3000 square miles of territory in the Warrior field and has an average thickness, from a great many measurements in different parts of this coal field, of from thirty to thirty-three inches. It is a fine heating or steaming or coking coal, and is well suited for making gas. In fact, it is believed to have no superior as a steaming and coking coal; the great draw back to it being the thinness of the seam, which naturally makes the cost of mining, and the prices of the coal greater than other Alabama coals, however, this coal has such a reputation that both it and its coke are sold away ahead of the out-puts. This Black Creek coal from the Milner coal and railroad company mines is reported to have an evaporating power of 8.01 pounds of water to the pound of coal, and to yield 4.82 cubic feet of gas to the pound of coal, and to make 33⅓ bushels of screened coke to the ton of coal. This coke is consumed in the founderies of the larger southern cities. As a black-smithing coal, the *Black Creek coal* takes a front rank. The following analysis made by Prof. Lupton, then of Vanderbilt University, will serve to show its proximate composition as taken from the mines at New Castle:

Specific gravity	1.29
Moisture	1.36
Volatile Matter	31.79
Fixed Carbon	64.71
Ash	1.82
Sulphur	32

This seam of coal has a fire clay cover and underbed, which are full of beautiful impressions of coal plants.

The seam of *black band iron ore* between (18) and (19) of *general section*, crops out in the railroad cut between the shoot and the station at New Castle, and on the east side of the railroad a short ways above or north of the station.

From this latter out-crop considerable of the ore has been raised, in time past.

For further details concerning this ore, the coals and the measures around New Castle, the reader is respectfully referred to the Reports of the State Geologist for the years 1876 and 1879.

The great fault spoken of in the Report for 1879, as showing in the railroad cut about one-half of a mile north of New Castle station, may run more in a north-west and south-east direction, than in an east and west direction as stated in the report, and it may be that there is a down throw along it of the south-west side. The elevated country north-west of New Castle and south-west of Morris' station, which forms the high divide between the waters of Cunningham and Crooked creeks, and which is from two to three hundred feet above these creeks may be of this down-throw. This high country seems to be composed almost entirely of hard shales, which, so far as is known, are almost barren of visible coal out-crops. Along the old Stout road, on this divide, in S. 35, T. 15, R. 3 W., there are out-croppings of the conglomerate between (35) and (36) of the *General Section.* This conglomerate, in its out-crops, is for the most part nothing more than a red friable sandstone, the pebbles being confined to the lower three or four feet. In these conglomerates, among the pebbles, there are to be seen many impressions of stems and twigs, and many concretionary iron-ore balls, and under them, with a few feet of slate intervening, at the mouth of Mrs. Belcher's spring branch, in the S. W. ¼ of S. 35, T. 15, R. 3 W., there is an out-cropping, twelve inches thick, of the upper bench of the coal (35) of the *General Section.* The strata at this coal outcrop appear to be dipping to the north-west, though for several miles south of this point, along the old *Stout road,* they appear to be in great waves from N W N. to S E S.

In Crooked Creek in the southern part of S. 34, T. 15, R. 3 W., there is a reported out-cropping of coal, and in this same creek, in sections 20 and 17, as it runs through the *creek fields,* there are several more coal out-crops, which are said to have been dug into to a depth of two and three feet without getting through them. These latter out-crops are some 300 feet below the top of the divide between the waters of this creek and Five Mile Creek, and have a dip of 6° to 8° to the south-east. Still farther down Crooked Creek, in a hollow in the N. E. ¼ of N. W. ¼ of S. 17, T. 15, R. 3 W., there is a showing of coal which extended down, as far as could be seen, to a thickness of some eighteen inches, and had a parting of slate about six inches thick, which commenced about eight inches from the top. Under this coal a few feet, there sets in a bluff of massive sandstones of an ashy gray color and with many rounded iron concretions. These rocks very likely contain pebbles in places, or is a conglomerate, perhaps the one between (17) and (18) of the *General Section.* Coal also makes its appearance in a spring in the N. W. ¼ of S. 17, T. 15, R. 3 W., and in the river in the N. W. ¼ of N. E. ¼ of S. 12, T. 15, R. 4 W. That in the river is said to be about thirty inches thick and to be of the very best quality, and to have furnished several boat loads, which were floated down to Mobile. To a high point on the north-west side of the river, just above Short's Ferry, in the S. E. ¼ of S. 11, T. 15, R. 4 W., there is a capping of loose conglomerate and pebbles, which doubtless belong just over (19) of the *General Section.* A short distance up the river from these conglomerates, and bordering on the river, there is a bluff of flag-rocks of great regularity. The lower rocks of this bluff have scattered through them like the pebbles in a conglomerate, small rounded concretions of ferruginous sandstone. In the road on the opposite or east side of the river, at the ford, just below the above ferry, and only a few feet above low water in the river, there is a strong chalybeate spring, which more than likely has its origin in the out-crop of a seam of coal. Higher up this road, or some seventy feet above low water in the river, a small fault appears to cross the road and to be running almost north and south, and some ten feet still higher, the conglomerate just over (17) of the *General Section,* occurs along the road. This conglomerate in these out-crops differs from most of the other conglomerates of the coal measures, in that the pebbles, which are principally of a black flint, are scattered through the entire thickness of the massive rocks. This conglomerate crops out in a great many places in this neighborhood on the east side of the river. Under this conglomerate, with from two to three feet of clayey shale intervening, there is the coal seam (17) of the *General Section*, which is said to be about three feet in thickness and has a fire clay underbed, as shown in Mr. Short's well and in a spring about one-fourth of a mile east of Mr. Short's. An other out-cropping of coal some two feet or more in thickness, and which is likely of this same seam under the conglomerate, is said to occur in a branch in the N. E. ¼ of N. W. ¼ of S. 18, T. 15, R. 4 W. Up this same branch, about one mile to the south-east, there is an out-cropping of a seam of coal which is considerably over the above conglomerate and is likely (18) of the *General Section*. The coal of this out-crop was visible to a thickness of only about fifteen inches, though it extended down as far as could be seen. It is covered for a few feet by hard shales, and then by massive sandstones of an ashy gray color.

The above out-crops along Crooked Creek and the river are on the north-west side of the basin or trough, and hence have a south-east dip.

Along the *Grimes' road*, on the high divide between the waters of Crooked and Five Mile creeks, there are several showings of coal smut from four to six inches thick, which are likely all of the same coal seam, (33) or (34) *Gen. Sec.*; and on the side of the hill, above Mr. Henry Grimes' spring, in the S. E. corner of S. 29, T. 15, R. 3 W., there is an other out-cropping of coal, about six inches thick, which may be of the same seam. In a spring near the center of S. E. ¼ of S. 32, T. 15, R. 3 W., an out-cropping of coal measures eighteen inches in thickness; it must be of a seam much higher in the series than the thin out-crops just mentioned, and is likely (36) of the *General Section*. Near the foot of the *Black Jack Ridge*, on the west side, in the northern part of the S. W. ¼ of S. 5, T. 16, R. 3 W., an out-cropping of coal was dug into which is said to have measured over two feet in thickness, and which is believed to be of the *Pratt seam*, (37) of the *General Section*, along the line of its most north-eastern out-crops. In the N. E. ¼ of S. E. ¼ of S. 5, T. 16, R. 3 W., there is a *gum spring* of strong chalybeate water, which doubtless comes from a seam of coal, as most of the chalybeate waters of our coal measures do have their origin in the weathering or oxidation of the pyrites in and near the coal seams. In Mr. B. F. Going's spring, in the N. E. corner of N. W. ¼ of S. 10, T. 16, R. 3 W., there is an out-cropping of coal about twenty-two inches thick, which is of a seam that crops out near the heads of a great many hollows or ravines throughout this immediate neighborhood, that is believed to be (36) of the *General Section*. Over this coal out-crop there is debris from five to six feet, which doubtless covers shale, then a bluffy sandstone, which contains streaks of coal and fossil limbs or twigs of a gray carbonaceous sandstone, each of which are encircled by a thin sheet of cubical coal. South-east of this spring several hundred yards, and some eighty feet below it, on New-found Creek, there is a showing of about eighteen inches of coal, which is likely (35) of the *General Section*. In this same creek, about one mile lower down, there is said to be another out-cropping of coal; and in the public road, in the S. W. ¼ of N. E. ¼ of S. 8, T. 16, R. 3 W., there is an out-cropping of the same seam of coal as shows in Mr. Going's spring. Some four to five feet over this coal smut, there sets in the massive, coarse grain, carbonaceous, ashy gray sandstone which is to be seen over the coal at Mr. Going's spring. In Mr. Jno. W. Belcher's spring, about a half-mile north-east of Mr. B. F. Going's, or in the S. W. corner of S. E. ¼ of N. E. ¼ of S. 3, T. 16, R. 3 W., this same coal seam, (36) of the *General Section*, or the twenty-two inch seam of Mr. Going's, again makes its appearance. The strata of all of these out-crops dip to the S E S. In the old *Stout road*, in the S. E. ¼ of S. 14, T. 16, R. 3 W., there is an out-cropping of coal with a fire clay underbed, which is probably the *Pratt seam*. Just down the road, or south from this coal, the out-crops are heavy beds of shales, which are knotty or curly, and which appear to be in steep waves from north to south. Still farther down this road, or south nearly one-fourth of a mile, there is an out-cropping of coal five inches thick, which we believe to be the *Guide seam*, or (38) of the *General Section.* The strata here appear to dip some 4° to 6° to the south or S E S., and continue to dip in this direction to about the *eight mile post* from Birmingham, when the dip changes to 10° to 15° to N W N., and continues in this direction, though getting steeper and steeper, until the edge of the coal measures or the anticlinal valley is reached. This dip to the N W N., or on the south-east side of the great synclinal trough, is here steeper than that to the S E S. or on the north-west side of the trough, and, in this respect, is different from what it is higher up in the north-east end of the trough, or near Warrior Station for instance. Along the old Stout road, over the divide between the waters of Black and Five Mile creeks, there are to be seen the out-crops of a slaty sandstone of an ashy color, which are full of large concretions of concentric rings. These concretions differ from those of the *pot holes*, etc., in that they are of harder materials than the matrix which inclose them, and hence, in weathering, instead of being the first portions of the rocks to crumble or of leaving their moulds in the rocks, they are left as loose *boulder balls*, which sometimes reach several feet in diameter. These out-crops appear to have a dip of 30° to 35° to the north-west. On the south side of the above divide, the New Castle road leaves the old Stout road, and near it, all the way to New Castle, there have been exposed the out-crops of the New Castle seam and those just above it. In the old Stout road, just south of the fork made by the New Castle road, there is the following out-crop:

Out-Cropping in the old "Stout Road," in N. E. ¼ of S. 35, T. 16, R. 3 W.

(6)	*Shale*; cover.	
(5)	COAL	1 ft. 3 in.
(4)	*Fire Clay*	8 in.
(3)	COAL	5 in.
(3)	*Fire Clay*; underbed	2 in.
(1)	*Shale.*	

This coal is believed to be (22) of the *General Section.* About three-quarters of a mile still farther down this road or to the south, at the ford across Five Mile Creek, or at Boyle's old mill, there is to be seen an out-cropping of the conglomerate between (17) and (18) of the *General Section,* which not only forms shoals in the creek but also a ridge, which runs parallel to the elevated south-east rim of the Coal Measures and is about one-half of a mile distant from it. The ridge made by these conglomerates is not continuous but consists rather of a series of short ridges in one general direction or line. These conglomerates, in the out-crop at the old mill, are carbonaceous or full of black specks, and have pebbles, perhaps with the exception of an occasional scattering one, only in their lower part. They are here from thirty to forty feet thick and appear to dip from 20° to 30° to N. 75° W.

Some two miles up the creek or ESE. from the above old mill, Five Mile Creek, in its flow from the anticlinal valley, cuts through the elevated south-east rim of the Coal Measures in what is known as *Boyle's Gap.* Detailed descriptions of the strata at that gap and along the South & North Alabama Railroad from the gap on to New Castle, have been given by the State Geologist in his Report for the years 1877-1878.

About one hundred and fifty yards SWS. from the old mill, there is, into an out-cropping of the New Castle seam, an old drift, which is known as the *Ash & Company's Coal Mines.* The New Castle seam in its out-crop at the mouth of this old drift, has about the following section:

Out-Cropping at "Ash and Company's Coal Mines,"
in the S. E. ¼ of S. 35, T. 16, R. 3 W.

(18)	*Shale*; cover, visible	15 ft. 0 in.
(17)	COAL	1 ft. 3 in.
(16)	*Slate*; black	½ in.
(15)	COAL	3 in.
(14)	*Slate;* bluish and clayey	1 ½ in.
(13)	COAL; rusty	9 in.
(12)	*Slate*	9 in.

(11)	COAL	2 ½ in.
(10)	*Slate;* black	½ in.
(9)	COAL	1 ¾ in.
(8)	*Slate*; black	½ in.
(7)	COAL	9 in.
(6)	*Slate*; black	½ in.
(5)	RASH; *slaty coal*	9 in.
(4)	COAL	9 in.
(3)	RASH; *slaty coal*	½ in.
(2)	COAL	5 in.
(1)	*Fire Clay*; underbed.	

The dip at this out-cropping appears to be about 15° to N. 80° W.

The top of the above ridge made by the conglomerates between (17) and (18) of fhe *General Section*, where passed over by the old Stout road is about one hundred feet above Five Mile Creek, at the ford at the old mill. Pebbles were seen along the road only on the south-east side of the ridge, showing that they are confined to the lower part of these conglomerates. About one-quarter of a mile south-east of this ridge or half way between it and the elevated south-east rim, and running parallel to them, there is an other ridge. In the hollow between these two most north-western ridges, a fault, seemingly small, crosses the road, and, in the road, about fifty yards south of this fault, there is an out-cropping, about twenty inches thick, of coal smut with clayey partings. The intermediate or middle ridge, above spoken of, has running along its top a *back-bone* or ledge from eight to ten feet thick, of a hard massive ashy gray sandstone, with a strike, where passed over by the old Stout road, of about N. 20°E., and a dip of about 45° to N. W. Along the road, this middle ridge is some forty to fifty feet taller than the inner one or the one made by the conglomerate between (17) and (18) of the *General Section.* Under the *back-bone* rock of this ridge and under the conglomerate of the inner ridge, there are thick beds of softer rocks, principally shales, which have been washed out into the deep valleys which separate the three ridges. Along the road, near the foot of the middle ridge on the south-east side, there are many small springs. South-east of this middle ridge about one-quarter of a mile and about one hundred feet higher, is the outer ridge or elevated south-east rim of the Coal Measures, which, in many localities, is known as *Rock Mountain*. This ridge here, so far as could be seen, has only one set of conglomerates, which resemble the *lower* though they may be the *upper* of the conglomerates near the base of the Coal Measures. They cap or extend along the top of the ridge or mountain as a thick ledge of massive rocks, which are, for the most part, a coarse grain, white, glistening sandstone, except near the bottom where they are, strictly speaking, a conglomerate, and where they are often nothing more than a mass of small flint pebbles glued together. The upper portion of these rocks, which are free of pebbles, are not always coarse grain, but, on the contrary, are occasionally very fine grain and hard and compact, like *buhr-stones*. The coarse grain rocks, on weathering, nearly always become very friable, and hence will easily crumble into masses of loose, coarse grains of sand. In the out-crop these rocks are so bent over on themselves as to bring their bottoms or the *conglomerate portions* on top, or to cause their dip to be reversed until it is some 80° to the south-east. The strike of these rocks, here at the crossing of the old Stout road, is about N. 48° E. By aneroid readings, the top of this elevated south-east rim or Rock Mountain is some 225 feet above Five Mile Creek at Boyle's old mill, and 160 to 170 feet above Valley Creek, near the *pump house*, therefore, according to these readings, Valley Creek, at the pump house, is from fifty-five to sixty-five feet higher than Five Mile Creek, at Boyle's old mill.

Some 250 to 300 yards south-east of Rock Mountain and parallel to it, there is a low ridge of *Clinton rocks*, and, between this mountain and ridge, all the bedded strata along the road are covered up by debris from rocks of the Coal Measures, hence we believe a fault runs between this mountain and ridge, along which either the Coal Measures are of a *down-throw* or more likely the anticlinal valley is of an *up-throw*.

In Rock mountain a short distance south-west of where it is crossed by the old Stout road, there is a gap in which the Georgia Pacific Railroad finds a passage through this rocky barrier. South-west of this gap Rock Mountain sets in again and continues on its regular south-west course, though not altogether so high and prominent, for some three miles, when it certainly gives out and does not make its appearance again, as a regular mountain, for some fifteen miles to the south-west. This portion of the south-east rim of the Warrior coal measures, in which Rock Mountain has been swallowed up by faults, is not so elevated and is not so steep on either side as where Rock Mountain forms the south-eastern boundary, as it is composed of much softer rocks and rocks much higher in the series than the hard conglomerates and sandstones of Rock Mountain. In this gap of fifteen miles the rocks of Rock Mountain do crop out in two detached short ridges, but they do not occur as a regular and well defined ridge or mountain until near Valley Creek, from which point they are continuous to the south-west on to beyond the county line or to a short distance of Vance's Station, on the Alabama Great Southern Railroad, in Tuscaloosa county.

Just north-east of the Georgia Pacific Railroad, soon after it enters the Warrior coal field through the above narrow gap, or near the center of T. 17, R. 3 W., there are numerous test holes and drifts into the out-crops of the coal seams from the Black Creek to the New Castle or from (14) to (21), inclusive, of the *General Section.*

The *Morrow Mines*, in the S. E. ¼ of S. 11, T. 17, R. 3 W., consist of one drift into the out-crop of the New Castle seam. This seam, in its out-crop at the mouth of the *Morrow Drift* or *Mines* has about the following section :

Out-Cropping of the New Castle Coal Seam at the Mouth of the Morrow Drift, in the S. E. ¼ of S. 11, T. 17, R. 3 W.

(11)	*Shale;* soft and rotten on out-crop.	
(10)	COAL; good	1 ft. 6 in.
(9)	*Slate;* clayey	1 in.
(8)	COAL	5 in.
(7)	*Slate;* clayey	1 in.
(6)	COAL	6 in.

(5)	*Slate*	1 in.
(4)	Coal	8 in.
(3)	*Mother of Coal*	1 in.
(2)	Coal; with thin streaks of slate in places	2 ft. 11 in.
(1)	*Five Clay;* underbed.	

Dip of the seam at the out-crop is about 10° to the N. W. This mine was not being worked at the time visited, in July, 1885, as it is said to be involved in a law suit. The coal cars were pulled out of the mines by steam and thence by a small locomotive one-half mile over a narrow guage road to the shoots on the Georgia Pacific Railroad.

About one-fourth mile S W S. from the Morrow Mine is the *Kelso Mine, No.* 2, which in July 1885, had just been opened up. It consists of one drift on the out-crop of the *Jefferson seam,* (15) of the *General Section,* which here has the following section:

Section of "Jefferson Seam" at the Mouth of the Kelso Mine, No. 2., *in the S. E.* ¼ *of S.* 11, *T.* 17, *R.* 3 *W.*

(7)	*Shale;* cover.	
(6)	Coal	1 ft. 3 in.
(5)	*Slate;* clayey	6 in.
(4)	Coal	9 in.
(3)	*Pyrites;* slate	streak.
(2)	Coal	1 ft. 7 in.
(1)	*Fire Clay;* fossiliferous.	

The dip of this coal on the out-crop is about 2½ inches to the foot to the north-west.

South-west from the Morrow Mines about one-half mile, or in the N. E. ¼ of S. 14, T. 17, R. 3 W. there is the old drift in a ravine, which is known as the *Peacock Mine.* This drift is in the out-crop of the New Castle seam, and is not now being worked. At the out-crop, the seam of coal appears to have about the following section:

Section of Coal Out-Cropping at the "Peacock Mines," in the N. E. ¼ of N. E. ¼ of S. 14, T. 17, R. 3 W.

(12)	*Shale;* cover.	
(11)	Coal; shaly	1 ft. 11 in.
(10)	*Slate;* clayey	2 in.
(9)	Coal; soft, brittle, cubical	4 in.
(8)	*Slate*	4 in.
(7)	Coal; bony	5 in.
(6)	Coal; good	9 in.
(5)	*Slate*	1½ in.
(4)	Coal; good	2 ft. 8 in.
(3)	*Slate;* clayey	6 in.
(2)	Coal; good	2 in.
(1)	*Fire Clay;* full of stone and leaf impressions.	

The dip of the seam on this out-crop is about 15° to N. W.

Still farther to the south-west, but in the same ¼ section as the Peacock Mines, near Mr. Moore's, the out-crop of the *Black Creek seam,* (14) of the *General Section,* has been dug into on comparatively high ground. On the surface, there were no indications of the underlying coal out-crop, which was found by digging a ditch across the measures. The smut had to be dug down into some four feet before it took any definite form, ten feet before any lump coal was reached, and twenty feet before the seam became solid coal. For these twenty feet the out-crop is about perpendicular, but below this point the seam begins to dip or lean to the north-west. It has a thickness of about three feet, with a little rash about two and one-half inches from the bottom. Messrs. P. H. Moore & Company intend to work this out-crop to get coal to burn bricks at their brick yard, about one-fourth mile off, on the Georgia Pacific Railroad, and to sell for domestic purposes in Birmingham.

Still further to the south-west nearly one and one-half miles, on the out-crop of the New Castle seam, immediately on the Georgia Pacific Railroad, in the N. E. ¼ of S. 22, and S. E. ¼ of S. 15, T. 17, R. 3 W., there are the drifts which are known as the *Ensley or Black Diamond Mines* and the *Tennessee Mines.* These mines consist of one drift each, which are on opposite sides of the railroad and are not more than 100 or so yards apart. They are being worked on leases by different parties, and in July of 1885 had an out-put of from only ten to twenty tons, each, per day, though a good deal of development work was being done, and the prospects were very good, of the above out-puts being greatly increased. The coal cars are pulled by steam from out of the mines to the tops of the shoots, where the coal is dumped immediately into the Georgia Pacific Railroad cars, standing on side tracks. The dip of the coal seam on the out-crop here, or at the mouth of the drifts, is from thirty to thirty-five feet to the 100 feet to the north 20° west; but 300 feet within the mines, it has so flattened until the dip is not more than fifteen feet to the 100 feet. The water of the mines is conducted into cisterns or pools, from which it is pumped out by means of steam pumps. The coal seam in these mines is in rolls or waves from north-west to south-east, and will average some seven feet in thickness, though it varies in thickness from five feet on top of some of the crests of the waves to nine feet in some of the troughs. These waves are usually some fifty feet long, from crest to crest, and two to three feet deep, from top of crest to bottom of trough. The irregularity in the thickness of the seam seems to take place altogether in the top and is due, sometimes at least, to the interposition in the coal of a parting of slate, which is thickest over the crests of the waves, where it squeezes out completely the coal above it, or takes the place of the upper coal in the seam. This parting or slate is thinnest or wanting where the coal is thickest or over the lowest portions of the troughs, where it appears to have been squeezed out or supplanted by the coal. The following sections represent the coal seam in these mines:

Sections of Coal Seam in "Black Diamond" and "Tennessee Mines," in S's. 22 *and* 15, *T.* 17, *R.* 3 *W.*

		(1)	(2)
(14)	*Sandstone;* cover.		
(13)	Coal; good	1 ft 5 in.	rash, 3 in.
(12)	Coal; bony	1 in.	2 in.

(11)	COAL; good and firm	4 in.	1 ft. 0 in.
(10)	*Slate*	1 in.	2 in.
(9)	COAL	6 in.	8 in.
(8)	*Slate*	4 in.	5 in.
(7)	COAL; bony or slaty		2 in.
(6)	COAL; good	1 ft. 2 in.	1 ft. 5 in.
(5)	*Rash*, coal and slate	3 in.	3 in.
(4)	COAL; good	1 ft. 6 in.	1 ft. 2 in.
(3)	*Slate*	1 in.	streak.
(2)	COAL	10 in.	8 in.
(1)	*Fire Clay*; underbed.		

No. 1, is a section of the coal seam in the *Black Diamond mines.*

No 2, is a section of the coal seam in the *Tennessee mines.*

In this New Castle seam in these mines, there is frequently at the bottom more than three feet of clean coal, and at the top as much as 18 inches of good coal without any partings. Extending up into the roofs of these mines, from a few inches to two and three feet, there are to be seen many rounded and oblong holes, which are known to the miners as *miners' pots* and *hog backs.* These holes were once curly or knotty places filled with slate and coal, which on being undermined fell out or were pulled out. Immediately under these holes, in the floor of the mines, there are usually protruberances which conform to the holes above, but are generally smaller. The coal between these protruberances and the holes above is curly or knotty from the sudden bending or curving in the strata to conform to the holes and protruberances. The coal and slate of the *miners' pots* and *hog backs*, on being undermined, usually become loose and are liable to fall out, hence they are dangerous to the miners. The fire clay underbed, and the immediate covering of this coal seam, are always full of coal plant impressions.

In a shallow cut near the *Ensley* or *Black Diamond mines* and some 200 feet under the seam of these mines, or the New Castle seam, there is a showing of about six inches of coal smut with fire clay cover and underbed, which is probably of (16) of the *General Section*, and in another shallow cut, near the *Tennessee mines*, and about 100 feet over their seam of coal or the same New Castle seam, there is an other showing of coal smut, which is about fifteen inches thick, and has a fire clay underbed. It may be (23) of the *General Section.*

North of the *Black Diamond* and *Tennessee mines* on the north-east side of the Georgia Pacific Railroad, there is a high level plateau that is covered with a growth of long leaf pine, hickory, oak, etc., and a fine sward of natural grasses, which make an excellent summer pasture. On this same side of the Georgia Pacific Railroad, some two miles northwest of the above mines, are the *Pratt Mines' Drifts,* or the *Drifts of the Pratt Coal and Iron Company.*

The *Pratt Mines,* as commonly understood, include all of the mines of the Pratt Coal and Iron Company in the Warrior coal field, which, at present, June, 1886, comprise, besides the above drifts, three slopes and one shaft, and the early completion, so it is said, of one more slope and another shaft.

The *Pratt Coal and Coke Company* was organized in 1878 with a capital stock of $200,000. They soon went to work and bought up 70,000 acres of coal land and sunk the present *Slope No.* 1. This company, with a daily out-put of about 900 tons of coal, had a successful run for about four years, or until 1882, when it sold out *lock, stock and barrel,* for $100,000 to the present owners, the world wide famous Pratt Coal and Iron Company. This company, with a capital stock of $1,500,000, steadily increased the mines and mining facilities until they now have a daily out-put of about 2,500 tons of coal, and a daily capacity of over 3,000 tons, and a new slope and shaft underway, which will double this out-put and capacity. It has also 710 coke ovens with a daily out-put of between 1,500 and 1,600 tons of coke per day, and, it is said, intends to commence to build, at an early day, 1,000 more ovens. Much of this coke will be consumed in the five *blast furnaces* of a daily capacity of 200 tons each of pig iron, which the company has now in course of erection. For the building of these furnaces and some steel works, the capital stock of the company has been greatly increased. This company, in addition to their working 600 State and county convicts, give employment to between 800 and 1,000 *free laborers*, and has a monthly pay roll of between $40,000 and $50,000. It also owns about thirty miles of wide guage railway, which connects the different mines with each other, and with Birmingham, and hence with all of the railroads that will ever come to Birmingham. It has six locomotives, and several hundred *drop bottom* ore cars.

All of the *Pratt Mines* are on or near the south-east out-crops of the *Pratt Seam*, (37) of the *General Section*, which are of the nearest and most convenient of the coal seams to Birmingham. The line of the south-east out-crops of this most excellent seam of coal is at the Drifts about two and a half miles from the south-east edge of the Warrior coal field which it gradually approaches to the south-west, until finally it runs out or strikes against a fault between the Coal Measures and the anticlinal valley, about one and a-half miles south-west of the Woodward Iron Company Coal Mines or in S. 20, T. 18, R. 4 W. In the upper or north-east half of this distance, the dip of this seam of coal is 15° to 20° to the north-west for several hundred feet down from the out-crops, when the dip suddenly changes to that of 5° to 6° to the north-west, the normal dip of the strata of the south-east side of the Warrior field where not effected by disturbances of any kind. In the lower or south-west half, however, of the above distance, this seam of coal is about perpendicular on the out-crops, having suddenly become so, and, at the Woodward Iron Company coal mines, this perpendicularity extends down for about 170 feet, when there is a sharp bend in the unbroken strata and a rapid assumption of the normal dip of 5° to 6° to the north-west. This seam of coal was first opened up some thirteen years ago by William A. Gould, one of the pioneer miners and prospectors in the coal fields of Alabama. It is not only the uppermost coal seam of the Warrior field that has ever been worked on a large scale, but has been for seven to eight years and is now much more extensively worked than any other coal seam in Alabama. It now has an out-put of nearly one-half of the coal that is mined in the State or of about

1,100,000 tons of coal per annum. Its area in this county is not more than seventy-five to eighty square miles. This area is of the shape of an enormous pear, with the pear on the north side of Village Creek, about equally divided by Five Miles Creek, and the stem of the pear, the sunken area, on the south side of Village Creek. This sunken area is a strip along the south-east edge of the coal field, about eight miles long and two miles wide. This Pratt seam is also supposed to cover about four square miles on the high divide between Valley and Mud creeks and to crop out along the county line on the high divide south of Mud and Big Shoals creeks. Its roof is usually a firm shale, which occasionally thins out and gives place to a hard sandstone; its underbed is a fire clay, full of stem and leaf impressions, for two feet or more to the underlying sandstone. It always has near its top a parting of slate which varies from one-half of an inch to four inches in thickness and frequently, though not always, it has near its bottom, or at its bottom, a few inches of clayey shale, which is sometimes a shaly rash. It is also occasionally divided up by very thin and irregular partings of slate and nearly always has more or less iron pyrites in sheets and concretionary balls, and usually contains much mineral charcoal. Its coal in the seam has a vertical flaggy structure or a distinct *face and butt* structure, and splits off from the face in broad sheets, which permits of its being mined much more easily on the *face* than on the *butt*. The coal, as a general thing, is rather friable and of a dull color, though sometimes it is compact and comes out in large blocks which crumble but little on handling and are very black and lustrous. It is used for iron ore smelting around Birmingham and for miscellaneous purposes.

The following five analyses, by three different analysts, of average samples representing the full thickness of this seam of coal, at five different places, will serve to show the quality of the coal of the *Pratt seam:*

	(1)	(2)	(3)	(4)	(5)
Specific Gravity ..	1.300	1.29	1.323	1.295	1.289
Sulphur.	.918	.47	1.696	1.203	.824

Moisture	1.501	1.07	.935	.855	.766
Volatile Matter	31.485	32.08	30.508	30.745	36 027
Fixed Carbon	61.598	64 30	65.543	65.075	60 333
Ash	5.416	2.08	3.014	3.325	2.874
	100 0001	00.000	100.000	100.000	100.000

Nos. (1) and (2) were of samples from the Pratt Mines and were made respectively by the State Geological Survey and by Prof. N. T. Lupton, then of Vanderbilt University. Nos. (3), (4) and (5) were of samples respectively from the Coalburg Coal and Coke Company Mines, from Drinking Branch and from New-found Creek, and were made by the late Prof. J. L. Campbell, of Washington and Lee University. This coal is a fine coking coal and yields a coke that has few superiors, if any, for iron ore smelting and foundry uses. The quality of this coke is represented by the following analyses :

(1)		(2)	
Fixed Carbon	93.01	Fixed Carbon	91.163
Ash	6 83	Ash	8.667
Sulphur	.57	Volatile Matter	.170
			100.000

No. 1 is by the late Prof. J. L. Campbell, of Washington and Lee University.

No. 2 is by Alfred F. Brainard, Analytical Chemist, Birmingham, Alabama.

Mr. Brainard has made an exhaustive analysis of the ash of *No.* 2, with the following results :

Iron Oxide	1.152
Alumina	3.510
Silica	93.370
Phosphorous	.032
Sulphur	.858
	98.922

These analyses, with favorable results in the long use in numerous furnaces and founderies, prove the excellence of the coke made from the coal of the *Pratt seam.* The coke of this coal is consumed principally in the furnaces of Alabama, though some of it goes to New Orleans, and perhaps to other cities, for other purposes.

The *Pratt Mines' Drifts* are on both sides of a ravine, in the S. E. ¼ of N. W. ¼ and E. ½ of S. W. ¼ of S. 9, T. 17, R. 3 W., at the terminus of a branch railroad of the Pratt Coal and Iron Company's Railroad. This branch railroad runs by *Slope No.* 2, and soon after it crosses the Georgia Pacific Railroad, or just before it gets to the above drifts, it forks, one track going down each side of the ravine under the coal out-croppings or the mouths of the drifts. These drifts are seven in number and are on both sides of the ravine which runs almost north and south. Five of them are on the west side of the ravine or on the dip of the coal, and two are on the east side of the ravine or on the raise of the coal. These mines are favorably located and opened for cheap mining without the aid of any expensive machinery. The headings are driven on water levels, and, to secure natural drainage, an entry has been driven on the dip clear through the mountain, a distance of three-fourths of a mile. An entry is also said to have been driven on the raise to day-light. Along these two entries, there can be driven thirty or more side entries, which would give these *drifts* a daily capacity of over 1,500 tons of coal. They were opened less than two years ago and now have an out-put of about 800 tons of coal per day. The coal cars are pulled by mules from out of the mines to the shoots where the coal is dumped immediately into the Company's cars, standing on the branch road. The following sections represent the *Pratt seam* in its outcrops at the mouths of the drifts:

Sections of Out-Crops of "Pratt Seam," at mouth of "Pratt Mines'" Drifts, in S. 9, T. 17, R. 3 W.

	(1)	(2)
(8)	*Shale*, hard, good cover.	
(7)	*Slate*, soft, clayey......6 in.	*Mother of Coal* ....1½ in.
(6)	COAL ....8 in.	*Coal*,...........3 ft. 6 in.
(5)	*Slate*, hard, black...1½ in.	
(4)	COAL, good.....3 ft. 11 in.	
(3)	*Slate*, soft, clayey....1½ in.	.....................5 in.
(2)	COAL..................5 in.	.... 8 in.
(1)	*Fire Clay*.... ..10 ft. 0 in.	...............10 ft. 0 in.

These sections represent the coal out-crops respectively on the west and east side of the ravine, and differ principally in either the entire absence or very thin showing in Section No. 2, or in the out-crops on the east side of the ravine, of the parting (5), which is so universally present as to be characteristic of the *Pratt seam.* On the east side of the mouth of this ravine and some three-fourths of a mile north of the drifts, are the *Stockton Mines.* These mines consist of one drift in the out-crop of the *Pratt seam* in the point of a hill on the east side of the Georgia Pacific Railroad, about one-half mile south of Coalburg. When last visited, in July 1885, these mines had been in operation not more than six months, and had an out-put of about fifty tons of coal per day. The seam in these mines is some 100 feet lower than its out-crops at the Pratt Mines' Drifts, though its dip in these mines is not more than one foot to the 100 yards to the W N W. The main entry runs with the rise of the coal, hence these mines have a natural drainage. The coal seam in these mines has about the following section:

Section of Coal Seam in Stockton Mines.

(7)	*Shale*, black, very hard.	
(6)	COAL, best for shop use	3 in.
(5)	*Slate*, with streaks of coal in places	3 in.
(4)	COAL	2 ft. 6 in.
(3)	*Slate*, soft, clayey	3 in.
(2)	COAL	5 in.
(1)	*Fire Clay*, hard, firm.	

Across the ravine, some 300 to 400 yards from these mines, and some ten feet lower, and only a few feet above the branch leading down from the *Pratt Mines' Drifts*, there is an old opening into this same *Pratt seam.*

About one mile north-east of the Stockton Mines, on the north side of Five Mile Creek, and from seventy-five to eighty feet above the creek, there is an out-cropping, about ten feet in thickness, of the conglomerate between (35) and (36) of the *General Section.* This conglomerate is carbonaceous and of an ashy gray color, and has its pebbles, which are principally small and black, confined to streaks. Under this conglomerate out-cropping some thirty-five feet, there is a bluff from fifteen to twenty feet high, of a very coarse grain massive sandstone, seemingly a conglomerate without any visible pebbles. Some three-fourths of a mile down Five Mile Creek or to the north-west, the above conglomerate forms shoals in Five Mile Creek, at the site of an old mill, some 400 yards above the mouth of Black Creek. On the north side of the road, some 600 yards north of the *Walker ford*, across Five Mile Creek, just below the mouth of Black Creek, and about sixty feet above the water at the ford, there is a drift into an out-cropping of the *Pratt seam* from under a high ridge. On the west bank of Five Mile Creek, some 200 yards below the above ford, are the coke ovens of the *Coalburg Coal and Coke Company*, and over these ovens on the north side of a ridge, are the coal out-crops in which are the mines or drifts of the Coalburg Coal and Coke Company.

The Coalburg Coal and Coke Company has an authorized capital stock of $1,000,000, and own 15,000 acres of coal lands along Five Mile Creek and the Georgia Pacific Railroad, nine miles north-west of Birmingham. The mines of this company consist of a series of drifts, ten or a dozen, in the S. E. ¼ of S. 32, T. 16, R. 3 W., driven into the out-crops of the Pratt seam, (37) of the *General Section*, near the lower part or bottom of the great synclinal trough. These mines were first opened some five years ago by the New Castle Coal and Ralroad Company. They were sold some three years ago to the Richmond and Danville Extension Company, and by them subscribed, so it is said, to the capital stock of the Coalburg Coal and Coke Company.

These mines are well located for cheap mining, and were so opened, and are now so worked, as to avoid all expenses and delays of hoisting and pumping machinery. The main and side entries are so run on the dip as to secure natural drainage, and to enable the mules, so it is said, to pull as many loaded cars out as empty cars into the mines. That the mouths of these drifts are near the lowest part of the great synclinal basin or trough, is shown by the fact that the dip of the strata on the west side of the creek, or in the mines, is from one-half to one foot in every 100 feet to the S. 15° E., while on the east side of the creek, this dip is just in the opposite direction. The coal seam, however, in these mines is in waves, which run in the direction of the dip, and which are about 150 yards long from top of crest to top of crest, and about two feet deep from top of crest to bottom of trough. It is also variable in thickness, or in places over the crests of the waves it has been squeezed down to fifteen inches in thickness, while, in some of the troughs, it has thickened out to five feet. The following sections were taken at different points in these mines:

Sections of "Pratt Seam" in Coalburg Coal and Coke Company's Mines.

		(1)	(2)	(3)
(7)	*Shale.*			
(6)	COAL	8 in.	8 in.	6 in.
(5)	*Slate,* BLACK BAND in places.	3 in.	4 in.	2 in.
(4)	COAL; good.....	2 ft. 6 in.	1 ft. 10 in.	3 ft. 0 in.
(3)	*Rash:* mining	1 in.	6 in.	3 in.
(2)	COAL......	5 in	*Fire Clay.*	*Fire Clay.*
(1)	*Fire Clay;* underbed.			

Sections (2) and (3) occur within the mines and (1) is the out-cropping at the mouth of Drift No. 5. The parting (3) thickens, and hence the coal (2) is under the floor of the mines and does not appear in sections (2) and (3). On the out-croppings across the mouth of the drift from section (1), the slate (5), in a bulge of several feet in length, is about twelve inches thick, and some fourteen inches above (6), or the top of the main seam, there is a one inch streak of cubical coal. These mines are well ventilated. The main entries are about eight feet wide and from four to five feet high. They give employment to 400 to 500 men, about 200 of whom are convicts. They are next to the largest coal mines in the State. They, in July, 1885, had a capacity of about 1,500 tons of coal per diem, which could easily be doubled, and an actual daily out-put of about 500 tons. The coal cars are pulled by mules from out of the mines to the scales on the shoots, where the coal is dumped into cars standing on an extension of the Georgia Pacific Railroad, from the present western terminus of its eastern division. This coal is an excellent steaming coal, as shown by the fact that it is used altogether in the engines on several of the railroads of Georgia.

The following is a reported analysis by the late Prof. J. L. Campbell, of Washington and Lee University, of an average sample of the coal from these mines; it will show the quality of the coal:

Volatile Matter	32.169
Fixed Carbon	63.369
Ash	3.341
Sulphur	1.022
	99.901

The most of the out-put from these mines goes to Atlanta, Georgia, and is used for steaming purposes. This coal yields about sixty per cent. of coke. The company in July, 1885, had burning twenty-five coke ovens of from five to six tons capacity each, and in course of construction thirty more ovens. These ovens are located on the banks of the creek under the mouths of the drifts, where they are convenient to both the coal and the water. This coke is being used with good results in both furnaces and foundries. It is consumed principally in the foundries of Atlanta, Georgia; Birmingham, Anniston and Montgomery, Alabama, and New Orleans, Louisiana.

Drift No. 5, which is just over the coke ovens, is the most northerly, and hence, from the dip of the strata, is the highest above the bed of Five Mile Creek of any of the drifts which are now being worked. The mouth of this drift is some seventy-five feet above low water in Five Mile Creek, and has cropping out under it, above low water level, near its shoot, about thirty and seventy feet below it, respectively, the *fire clay seam* or 18 *inch seam*, (36) of the *General Section*, and the seam two feet six inches thick, (35) of the *General Section*, which is known as the *double seam* from a parting of slate, six inches thick, near its middle. On the sides of a ravine, for some two miles north from these mines, there are to be seen out-crops of this Pratt seam, which from the dip, S. 20° E., of course gets higher and higher as you go to the north, until it crops out on the divide between New-found and Crooked creeks. The divide between New-found and Five Mile creeks is some 175 to 200 feet above the creeks and is made up principally of the heavy bedded shale just over the Pratt seam. The growth over the out-crops of this shale, which is chiefly oak and hickory, forms quite a contrast to that of the pine on the north and south, over the out-crops of more siliceous strata.

For some seven miles to the north-west or down Five Mile Creek from Coalburg, there are out-crops of the *Pratt seam* and the two underlying seams, or the *fire clay seam* and the *double seam.* These out-crops gradually get higher and higher above the creek as you go to the north-west, until they crop-out in the high country along Cane Creek, in the northern part of T. 16, R. 4 W.

In the N. W. ¼ of S. E. ¼ of S. 32, T. 16, R. 4 W., there are two out-croppings of the Pratt seam, which show as follows:

Out-Crops of Pratt Seam,
in the N. W. ¼ of S. E. ¼ of S. 32, T. 16, R. 4 W.

		(1)	(2)
(4)	*Shale;* hard and curly.		
(3)	COAL	6 in.	3 in.
(2)	*Slate*	1 in	2½ in.
(1)	COAL; visible	1 ft. 2 in	1 ft. 4 in.

In Five Mile Creek, about ¼ mile west of the most southern of the above out-crops, or in the S. E. ¼ of N. W. ¼ of S. 32, T. 16, R. 3 W., there is said to be an out-cropping of coal which is likely of the *double seam* or the lower of the three seams spoken of above, and only five to six feet above this creek, in the N. W. ¼ of S. W. ¼ of the same section, the upper of these three coal seams or the *Pratt seam,* makes its appearance about as in No. 1 of the following sections; No. 2 being an other out-crop of the same *Pratt seam* in the N. E. ¼ of S. W. ¼ of S. 31, T. 16, R. 3 W.:

Out-Crops of the Pratt Seam, in the N. W. ¼ of S. W. ¼ of S. 32 and N. E. ¼ of S. W. ¼ of S. 31, T. 16, R. 3 W.

		(1)	(2)
(5)	*Shale;* cover.		
(4(	Coal	5 in.	6 in.
(3)	*Slate*	½ in	1½ in.
(2)	Coal; reported	4 ft. 0 in.	visible 2 ft. 4 in.
(1)	*Debris.*		

In the same *forty* (acres) as No. 2, of the above sections, the *fire clay seam* and the *double seam* also show themselves, and in the N. W. ¼ of the same ¼ section as No. 2, the *Pratt seam* again crops out, this time in the public road. At *the straight fence*, in the S. W. ¼ of S. E. ¼ of S. 25, T. 16, R. 4 W., there is said to be an out-cropping of coal in Five Mile Creek; and on the side of the ridge, some eighteen feet above the creek, there is a showing of about fifteen inches of coal smut, in the debris at the foot of a bluff of massive gray sandstone. These coal out-crops are believed to be respectively of the *double seam* and *fire clay seam*, and hence the Pratt seam is thought to be here above the bluff. The *Pratt seam* and the *fire clay seam* also show in the S. W. ¼ and N. E. ¼ of N. W. ¼ of S. 32, T. 16, R. 3 W., and the *fire clay* and *double seams* crop out in the N. W. ¼ of N. W. ¼ of the same section. There is a showing of coal, eighteen inches thick, in a spring in the south-east corner of S. 25, an other twenty inches thick in the railroad cut in the N. E. ¼ of the same ¼ section, and an other, six inches thick, in a branch in the same *forty* as the last, and an other still, twelve inches thick, in an other branch in the S. W. ¼ of N. E. ¼ of the same section, all of T. 6, R. 4 W. The out-crops in the spring and in the railroad cut are believed to be of the *fire clay seam*, while the two out-crops in the branches are likely of the upper part of the *double seam.* Under the first coal in the branch, there is a reported thick seam of coal, which is probably the main part of the *double seam.* In the public road and in a branch just east of *Biven's Chapel*, in the N. W. ¼ of S. W. ¼ of S. 25, T. 16, R. 4 W., there are out-crops of the *fire clay* and *double seams;* and, in the road, not far west of the above chapel, there are other coal out-crops which are seemingly of the *Pratt seam.* Near Mr. Jonas Wheeler's, about the center of S. 26, T. 16, R. 4 W., an out-cropping of coal covers the bed of Prude's Creek, of which nothing could be told as to its thickness, though it is believed to be of the *fire clay seam.* North-west of Mr. Wheeler's about one-quarter of a mile in a hole that is filled with water, in the bed of a branch, there is an out-cropping of coal, which is reported to be from five to six feet in thickness; and, some three hundred yards still farther west, in Prude's Creek, at the mouth of the above branch, and also on the side of a branch, about one-quarter of a mile south-west of the above hole in the branch, there are out-crops of coal, all of which are probably of the *Pratt seam.* In an old field in the N. W. ¼ of S. 26, T. 16, R. 4 W., there is a showing of coal smut about three feet in thickness, which is likely of the *Pratt seam.*

On the head waters of New-found Creek, as far north as the line between T's 15 and 16 and almost as far east as the line between R's 2 and 3 W., there are to be seen out-crops of the *Pratt seam* and these underlying seams. Besides the coal out-crops which have been already noticed on the divide between New-found and Crooked creeks and on the extreme head waters of New-found Creek, others have been seen on this latter creek in the S. W. ¼ of N. E. ¼ and N. E. ¼ of N. W. ¼ of S. 8, and in the N. W. ¼ of S. W. ¼ of S. 6, T. 16, R. 3 W., but they showed too imperfectly to be able to tell anything about them.

On the banks of Prude's Creek, in front of Mr. Jones' house or in the S. E. ¼ of S. 22, T, 16, R. 4 W., there is an out-cropping of coal, that is visible to a thickness of about two feet, which is probably of the *double seam,* and above it in the road just west of Mr. Jones, there is a showing of coal smut which may be of the *fire clay seam.*

Around Mr. Albert J. Wheeler's house, in the N. W. ¼ of S. 22, T. 16, R. 4 W., there are several out-croppings, about twelve inches thick, of the *fire clay seam,* and west of Mr. Wheeler's, about one-quarter of a mile, or near Milton Hudson's, colored, in his *well spring* and in the bed of a branch, there are the out-croppings of two seams of coal, which are most probably of the *Pratt seam* and the *fire clay seam.* The out-crop in the *well spring* or the one of the supposed Pratt seam, is said to be three feet four inches thick, and the one in the bed of the branch, which is likely of the *fire clay seam,* is reported to measure four feet in thickness, with doubtless an included slate parting.

In the branch in *Sleepy Hollow,* in the N. E. ¼ of N. E. ¼ of S. 21, T. 16, R. 4 W., there is a coal out-cropping which is visible to a thickness of eighteen inches and which is said to be two feet in thickness. It is under a bluff of curly, hard siliceous shale, which is full of coal plant impressions and has some ten inches above the coal an interbeded row of *kidney shape* concretions of *clay iron stone.* This coal is of a seam which is considerably under the *fire clay seam,* it may be of the *double seam* or (35) of the *General Section.* Higher up *Sleepy Hollow,* or south-west of this coal out-cropping about one-quarter of a mile, in the S. W. ¼ of N. E. ¼ of S. 21, T. 16, R. 4 W., there is the following out-crop of the supposed *fire clay seam:*

Out-Crop of the "Fire Clay Seam," in Sleepy Hollow, in the S. W. ¼ of N. E. ¼ of S. 21, T. 16, R. 4 W.

(5)	*Shale*; curly, siliceous, bluffy, cover.	
(4)	COAL	1 ft. 3 in.
(3)	*Slate*	2 in.
(2)	COAL	1 ft. 2 in.
(1)	*Slate, Debris.*	

In the shale just over the coal, there was a species of *calamite,* which was distinctly marked and easily broke along the joints. The strata at this out-crop dip 3° to 4° to south-east. Across *Sleepy Hollow,* or SES. from the above out-crop, about three hundred yards, in the same forty, there is the following out-crop of the *Pratt Seam:*

Section of Out-Crop of the Pratt Seam, in the Head of Sleepy Hollow, in the S. W. ¼ of N. E. ¼ of S. 21 T. 16, R. 4 W.

(10)	*Shale;* cover.	
(9)	COAL	2½ in.
(8)	*Slate*	1 in.
(7)	COAL:	¾ in.
(6)	*Slate*	4 in.
(5)	COAL	visible 3 ft. 4 in.; reported 4 ft. 5 in.
(4)	*Debris*	1 to 2 ft. 0 in.
(3)	*Fire Clay;* underbed	visible 6 ft. 0 in.
(2)	*Sandstone*	4 to 5 ft. 0 in.
(1)	*Debris,*	

The Pratt Seam also crops out on the opposite side of the ridge from this last out-cropping or in the N. E. ¼ of N. E. ¼ of S. 28, T. 16, R. 4 W., where it was dug through and is said to measure four feet five inches in thickness. In this last out-cropping, the coal is perfectly naked over the entire bed of the branch or forms the bed of the branch for some twenty-five steps, with a visible thickness of about fifteen inches. It is of a flaggy structure or has regular parallel perpendicular planes of division, from one to two inches apart, running north-east and south-west. This coal out-crop is some 165 feet lower than the other out-crop of the same coal seam on the opposite side of this dividing ridge, the dip is therefore decidedly to the south-east.

Across Five Mile Creek from the mouth of *Sleepy Hollow,* on the side of a high ridge in the S. W. ¼ of S. 15, T. 16, R. 4 W., there are out-crops of all three of the coal seams which we have been considering, or of the *Pratt, fire clay and double seams.* The lowest of these out-crops, which is of the lowest or *double seam,* shows in the public road, at the bottom of a hill, and in the fields on each side of the road. The out-crops of the other two seams are to be seen on the side of the hill in the public road, in which out-crops the *fire clay seam* shows to a thickness of only eight inches, while the smut of the *Pratt seam* is about four feet thick and has a slate parting near the bottom. On this same hill or ridge side, in the mouth of the railroad tunnel, which is several hundred yards north-east of the above public road, and also in the first hollow above or north-east of the tunnel, there are out-crops of the *fire clay seam.* The smut of the out-crop in the tunnel measures ten inches in thickness, though the coal of the out-crop in the hollow north-east of the tunnel is about fifteen inches thick. These three seams of coal also crop-out on the opposite or north-west side of this *tunnel ridge*, and on the side of the next hill or ridge to the north-west. They show in the public road, on the side of each of these ridges, which are about one-half mile apart. Those on the side of the most north-western ridge are just east of Mr. A. J. Linn's residence, in the south-west corner of S. 10, T. 16, R. 4 W., and commencing with the *Pratt*, or uppermost *seam*, show to a thickness of respectively four feet, two feet, and sixteen inches, though the lower one of these out-crops, or the one of the *double seam*, especially, is badly exposed, and is no indication of the true thickness of the seam. There is also near the bottom of this hill, some twenty feet under the *double seam*, a thin showing of an other coal seam. This ridge, or rather high plateau with deeply croded channels, is broad and flat on top, and has precipitous banks along Five Mile Creek, and has projecting from out of these banks above the track of the Georgia Pacific Railroad, at equal intervals, one above the other, from three to four escarpments or prominent ledges of hard rocks about ten feet each in thickness. Lower down Five Mile Creek, under the *county's bridge*, at Mr. Sam Linn's mill, in the S. E. ¼ of S. W. ¼ of S. 4, T. 16, R. 4 W., the strata along the bed of the creek are in waves from north-west to south-east, though they have a general dip of several degrees to the south-east. In the road along the top of the above ridge or high plateau, just west of Mr. A. J. Linn's, there are several out-croppings of coal which are doubtless of the same seams as those on the side of the hill just east of his house.

Around Mr. J. T. Hayes', in the N. W. ¼ of S. 10, T. 16, R. 4 W., on the divide between the waters of Five Mile and Cane creeks, are the most north-western out-crops, that have been seen of the *Pratt seam*, though doubtless these out-crops do cross Cane Creek, and can be found near the top of the high dividing ridge between this creek and the river.

On the very head waters of Cane Creek, in S. 31, T. 15, R. 3 W., there are several out-croppings of coal which, as reported, vary in thickness from eighteen inches to two feet six inches. They are of coal seams lower than the *Pratt seam*, probably (34) and (33) of the *General Section*.

The Pratt seam in its most north-western out-crops around Mr. Hayes', is said to be about four feet thick, and that its coal has been tested by the neighborhood blacksmiths and found to be a good coal to work in the shops. The out-crop of this Pratt seam in Mr. Hayes' spring has about the following section :

Out-Crop of Pratt Coal Seam in Mr. J. T. Hayes' Spring, in the N. W. ¼ of S. 10, *T.* 16, *R.* 4 *W.*

(6)	*Sandstones.*	
(5)	*Shale*, cover	3 ft. 0 in.
(4)	COAL, shaly on weathering	4 in.
(3)	*Slate*	3 in.
(2)	COAL	1 ft. 8 in.
(1)	*Sandstone.*	

This out-cropping is rather thin for the *Pratt seam*. It has scattered through it an occasional ball of iron pyrites, and shows plainly the flaggy structure of the coal, or the parallel perpendicular planes of division which run through it from north-west to south-east, every inch or two apart. The *Pratt seam* also crops out in a ravine just east of the above spring, and in an other spring about one-fourth of a mile west of the above spring.

The *fire clay seam*, some twelve inches thick, crops out about one-half mile west of Mr. Hayes' in Mr. J. H. Wood's spring, and in the road near his house. On the side of the ridge, across Cane Creek, in front of Mr. Martin Woods' house, there is an out-cropping of coal fifteen inches thick, with an underbed of fire clay, which looks very much like the *fire clay seam*, (36) of the *General Section*, though it is believed to be (34) or (31) of the *General Section*. Some two to three hundred yards west, and on the opposite side of the ridge from the above coal out-cropping, and about twenty-five feet lower, there is the following out-cropping of coal which resembles the *double seam*, (35) of the *General Section*, though it is believed to be (33) or (30) of the *Genera Section*:

Out-Crop in S. W. ¼ of S. 33, T. 15, R. 4 W.

(7)	*Shale*, bluff	14 to 15 ft. 0 in.
(6)	Coal	1 ft. 1 to 2 in.
(5)	*Slate*	streak.
(4)	Coal	0 ft. 6 to 8 in.
(3)	*Slate*	0 ft. 5 in.
(2)	Coal	2 ft. 3 in.
(1)	*Slate*, underbed.	

In an other place, just up the branch, this out-cropping of coal appears to consist of alternate thin streaks of coal and slate. It has a dip of 4° to 5° to the south-east. This same coal seam also crops out in two places in a field, or about 100 yards and 400 yards west of the above out-crop, and also in Cane Creek about one-fourth of a mile south of the above out-crop. The out-crop in Cane Creek appears to consist of alternate seams of coal and slate, while those in the field show about five feet of coal smut, with a central parting of clayey slate about one foot thick.

Still farther to the north-west, in the road near the top of the divide, south of Goggin's Ferry, or in the N. E. ¼ of S. 29, T. 15, R. 4 W., there is an out-cropping of from six to eight inches of coal smut, which is some 175 feet above the river, and ten feet above the conglomerate between (17) and (18) of the *General Section*. Not far from this last coal out-crop there is said to be in Mr. Myrix's spring, on the south-east side of the divide, an out-cropping of coal, which may be of the same seam, (18) of the *General Section*. The above conglomerates are micaceous and of a yellowish-gray color, and include, besides its flint pebbles, others of sandstone, which are not quite so rounded as those of the flint. On the weathered out-crops, these hard conglomerates are often friable, to which effects of weathering are due the deep sand beds that are frequently encountered along the roads. The above conglomerates were also seen on the opposite side of the river, near the top of a high point over a tall bluff along the river, in the N. E. ¼ of S. 36, T. 15, R. 5 W., and on White Oak Creek, in the N. W. ¼ of S. W. ¼ of S. 36, T. 15, R. 5 W. In the latter place, they occur as huge boulders, scattered over the side of the ridge, and have under them, some twenty feet, in the bed of White Oak Creek, thick flagstones and massive sandstones, which dip about 4° to the south-east. Some quarter of a mile up White Oak Creek or north-west from these conglomerates, there is the following out-crop of coal in the S. W. ¼ of N. W. ¼ of S. 36, T. 15, R. 5 W., which is known as the *Burns' Coal Bed:*

Out-Crop at Burns' Coal Bed,
in the S. W. ¼ of N. W. ¼ of S. 36, T. 15, R. 5 W.

(6)	*Soil*	6 to 7 ft. 0 in.
(5)	*Slate*, COAL, *Loam*	1 ft. 2 in.
(4)	*Clayey Loam*	2 ft. 0 in.
(3)	COAL	1 in.
(2)	*Slate;* clayey	4 in.
(1)	COAL; visible	1 ft. 2 in., said to be 2 ft. 0 in.

This out-crop is badly covered up and gives but a very poor idea of the true nature of the seam of coal. Some twenty steps down the creek from this out-crop or coal bed, there is about nine inches of very hard and good coal, under a bluff of hard slate some twelve feet high, and over hard blue slate with streaks of coal, showing about three feet in thickness, to edge of water. This coal must be the upper part of the seam of the *Burns coal bed,* unless there is a fault between the two out-crops. On the top of a hill, west of these out-crops about one-fourth of a mile and about fifty feet above them, a seam of coal has been dug into, which is probably of (16) of the *General Section,* while the *Burns' coal bed* is of (15) of the *General Section.* In the road, as it ascends the hill on the east side of White Oak Creek, near its mouth, or in the S. E. ¼ of N. E. ¼ of S. 1,

T. 16, R. 5 W., there is an out-cropping of the *New Castle seam*, (21) of the *General Section*, in what is called *Mrs. Bailey's Coal Bed:*

Out-Crop of New Castle Coal Seam, in Mrs. Bailey's Coal Bed, in the S. E. ¼ of N. E. ¼ of S. 1, T. 16, R. 5 W.

(7)	*Sandstone.*	
(6)	*Shale*	18 ft. 0 in.
(5)	COAL SMUT	2 ft. 4 in.
(4)	*Slate*; clayey	10 in.
(3)	COAL SMUT	5 ft. 11 in.
(2)	*Fire Clay;* underbed	3 ft. 0 in.
(1)	*Sandstone.*	

This out-crop appears to have a dip of about 4° to the south-east. In the river, at Glover's Ferry in the S. E. ¼ of N. W. ¼ of S. 11, and in the N. E. ¼ of N. E. ¼ of S. 14, and near the mouth of Five Mile Creek, there are said to be out-crops of coal. The last mentioned out-crop is reported to have the following section:

Out-Crop of Coal in Locust Fork of Warrior River, near the Mouth of Five Mile Creek.

(3)	COAL	8 in.
(2)	*Slate*	1 in.
(1)	COAL; under water, may contain slate	4 ft. 0 in.

Near the Widow Wiley's, in the N. E. ¼ of S. E. ¼ of S. 10, T. 15, R 5 W., there is in the road coal smut from ten to twelve inches thick, and in her spring there is said to be more coal, which must be of a lower seam. On a branch, and under a bluff, in the S. E. ¼ of N. W. ¼ of S. 15, T. 16, R. 5 W., there is to be seen an out-cropping of coal two feet ten inches thick, with a dip of about four feet in ten or twelve steps to the south-east. Lower down this branch, or in the N. E. ¼ of S. W. ¼ of S. 15, T. 16. R. 5 W., there is an other out-cropping, in which about fourteen inches of coal is visible, though the seam is likely thicker than this, as boat loads of coal have been raised from this out-cropping and floated down to Mobile. The last two coal out-croppings are believed to be, respectively, (22) and (23) of the *General Section.* In an other branch in the S. E. ¼ of S. W. ¼ of this same section, there can be seen the lower six inches of a coal seam which breaks out in large blocks, and some 150 yards farther down the branch, or in the S. W. ¼ of S. E. ¼ of the same section still, there is visible to a thickness of two feet three inches, a seam of coal which has a parting of slate twelve inches thick, but, as its cover is debris and its bottom can not be seen, there is no telling anything definite as to the thickness of the seam. A few feet under the coal of the last out-cropping, there are thick flagstones with perpendicular and parallel planes of division, and in the bed of the river, near the mouth of the branch, in the same *forty*, there is said to be the following coal out-crop:

Out-Crop of Coal in Locust Fork of Warrior River, in the S. W. ¼ of S. E. ¼ of S. 15, T. 16, R. 5 W.

(5)	COAL	1 ft. 6 in.
(4)	*Slate*	4 in.
(3)	COAL	3½ in.
(2)	*Slate*	2½ in.
(1)	COAL	1 ft. 8 in.

The last three coal out-crops noted above in the branches, were doubtless of the same seam as this one in the river, which is probably (26) of the *General Section.*

At Mr. Wm. Golden's spring in the south-west corner of the S. W. ¼ of S. 9, T. 16, R. 5 W., there is an out-cropping of coal about nineteen inches thick, and along Morgan's Creek, just below Parson D. Jenkins' residence, or in the S. E. ¼ of S. W. ¼ of S. 8, T. 16, R. 5 W., there are several coal out-crops, which may be of as many different seams, though they show too imperfectly to say for certain. The one highest up the creek appears to be about six inches thick and to consist of alternate streaks, from one to two inches thick, of coal and slate; and the next two show respectively as in the following sections:

Out-Crops on Morgan's Creek, in the S. E. ¼ of S. W. ¼ of S. 8, T. 16, R. 5 W.

	(1)	(2)
(4) *Debris.*		
(3) COAL; visible	1 ft. 6½ in.	1 ft. 4 in.
(2) *Slate*	8 in.	11 in.
(1) COAL	1 ft. 6 in.	2 ft. 0 in.

These last two coal out-crops are about forty yards apart and are doubtless of the same coal seam. In No. 1, the lower five inches of (3) is bony and is separated from its upper part by about one-half inch of mineral charcoal; and in No. 2, the upper four inches of (1) is very bony or slaty, while the lower part is of a glistening black color and is very bituminous. On the side of a hill some thirty feet above the bed of the creek or these last coal out-crops, there is an out-cropping of an other seam of coal These outcrops along Morgan's Creek are at the south-west terminus of the anticlinal fold along the north-west border of the county or of the great anticlinal fold of which the Sequatchie Valley of Tennessee and Brown's Valley of Alabama are denuded portions. They are just to the north-west of the axis of this great anticlinal fold as they have a general dip, which is small, to the north-west. They are also in waves from north-west to south-east and are more than likely of the strata from (21) to (23), inclusive, of the *General Section.*

In Village Creek, near its mouth, where it is some two hundred feet below the general level of the country, there are several out-croppings of a thick seam of coal of which the following is said to be a section :

Coal Out-Crop in Village Creek, near its Mouth.

(9) COAL	5 in.
(8) *Slate*; clayey	4 in.
(7) COAL	1 ft. 3 in.
(6) *Fire Clay, Slate*	1 ft. 2 in.
(5) COAL	1 ft. 6 in.
(4) *Slate*; parting	1 in.
(3) COAL	8 in.
(2) *Slate;* clayey	1 ft. 5 in.
(1) COAL	3 ft. 2 in.

This section is doubtless of (28) of the *General Section.* There crops out a seam of coal in a slough on the north side of the creek, in the N. W. ¼ of N. W. ¼ of S. 28, T. 16, R. 5 W., with about only twelve inches of coal visible, and in the creek, at the mouth of the slough, about forty steps away, where, years ago, boat loads of coal were raised. This coal is of a lower seam than that of the above section or it is of (26) of the *General Section.* Boat loads of coal were also raised in 1839 from other out-crops a little higher up the creek, or in the S. W. ¼ of S. E. ¼ of S. 21 and S. W. ¼ of S. W. ¼ of S. 22, T. 16, R. 5 W., which are doubtless the out-crops of the coal seam of the above section or (28) of the *General Section.* Lumps of coal of three and four feet in thickness, or weighing 800 and 1000 lbs. are said to have been raised from these out-crops by "the novel process in the art of mining, diving for coal," as described by Prof. Tuomy in his First Biennial Report, 1850.

On the south side of Village Creek, in a branch in the S. W. ¼ of N. W. ¼ of S. 26, T. 16, R. 5 W., there are the out-croppings of two seams of coal, which are from twenty-five to thirty feet apart. The upper of these coals is covered by massive curly shale and shows only its top. It is believed to be thin and only a few feet under it were to be seen slabby sandstones. The lower of the above coals occurred along the bed of the branch for twenty-five to thirty steps and had suffered much from weathering. It had an underbed of fire clay and showed to a thickness of eighteen inches, though some of it may have been covered up or washed off, as it had a cover of debris. These out-crops may be of (32) and (33) of the *General Section.* On the north side of Village Creek, along a branch in the N. E. ¼ of N.W. ¼ of S. 24, T. 16, R. 5 W., there is the following out-crop of coal, doubtless of (30) of the *General Section:*

Out-Crop in the N. E. ¼ of N. W ¼ of S. 24, T. 16, R. 5 W.

(8)	*Sandstones.*	
(7)	*Shale;* cover	4 ft. 0 in.
(6)	COAL	5 in.
(5)	*Slate*	¼ in.

(4)	COAL; with streaks of coal in places	1 ft. 9 in.
(3)	*Fire Clay;* hard, siliceous, fossiliferous	6 to 8 in.
(2)	*Slate;* hard and black	4 to 6 in.
(3)	COAL; cubical, visible	1 ft. 0 in.

This out-crop appears to have a dip of 6° to 8° to the south-east. On an other branch in the N. W. ¼ of N. E. ¼ of S. 25, T. 16, R. 5 W., there is an out-cropping which is said to be the best coal known of in this neighborhood. It may be of the same seam as the section above or it may be of a lower seam, (27) of the *General Section.* There is reported to be in Village Creek, some 150 yards below Dean's old mill site, in the S. E. ¼ of S. W. ½ of S. 25, T. 15, R. 5 W., a seam of coal from twenty-two to twenty-three inches thick, with several partings of slate, and in a deep hole in the creek, just below this old mill site or the old dam, an other out-cropping of coal which is over seven feet thick and has many partings of slate. These two out-crops are doubtless of the same seam, which is likely (30) of the *General Section.* On the side of the road to the above old mill, or in the N. W. ¼ of S. E. ¼ of S. 25, T. 16, R. 5 W., about twenty-five feet above the bed of Coal Creek, some one-hundred yards from its mouth, there is the following out-cropping of coal which resembles the Pratt seam in its section; it is believed to be (38) of the *General Section:*

Out-crop in N. W. ¼ of S. E. ¼ of S. 25, T. 16, R. 5 W.

(6)	*Sandstones.*	
(5)	*Shale;* cover, about	8 ft. 0 in.
(4)	COAL SMUT	3 in.
(3)	*Slate*	2 in.
(2)	COAL; streak of slate about three inches from top.	2 ft. 6 in.
(1)	*Slate.*	

In Coal Creek, a hundred or so yards above this last coal out-crop, and still higher up, or in the N. E. ¼ of S. 25, T. 16, R. 5 W., there are said to be out-crops of coal, which are believed to be of (31) of the *General Section.* Dip of rocks along Coal Creek between these coal out-crops seems to be 8° to 10° to the south-east. Further to the north-east, in the same old mill road as the above, near the centre of the N. E. ¼ of S. 25, T. 16, R. 5 W., there is a showing of coal smut from fifteen to twenty inches thick, under a massive coarse grain sandstone, and over an underbed of fire clay about two feet thick. This out-crop, though it has about the same altitude as the one on the side of the road, near the mouth of Coal Creek, is believed to be of the same seam as the one in Coal Creek nearest its mouth or of (31) of the *General Section.* Just over the above out-crop highest up stream in Coal Creek, there is a massive coarse grain sandstone, which is doubtless a conglomerate in places, and which also shows in the Glover's Ferry old road, in the N. W. corner of S. 30, T. 16, R. 4 W. This massive rock is of an ashy gray color and is made up of very coarse grains of sand like a conglomerate, though no pebbles were seen in it. In the south-east corner of N. E. ¼ of N. W. ¼ of S. 30, T. 16, R. 4 W., on a branch which empties into Coal Creek from the east, there is an out-crop of coal which is said to be three feet thick; it is likely of (33) of the *General Section.* Lower down the branch than this out-crop, and between five and ten feet under the out-crop, there is to be seen a streak of coal about one inch thick. In an other branch, which comes into Coal Creek still higher up, and from the opposite or west side, there is an out-cropping of coal which measures from twenty-seven to twenty-eight inches in thickness. It is of a lower seam than the last out-crop, and is believed to be of (32) of the *General Section.* It also crops out on the next branch up Coal Creek on this side, or in the S. E. ¼ of N. E. ¼ of S. 19, T. 16, R. 4 W., where it is twenty-seven inches thick, and in Coal Creek still higher up, in the N. E. ¼ of S. W. ¼ of S. 20, T. 16, R. 4 W., where it measures about two feet in thickness. On the same branch as the next to the last coal out-crop named, and some thirty feet above that out-crop, and about 110 feet below the top of the ridge, there is in the N. E. ¼ of N. E. ¼ of S. 19, T. 16, R. 4 W., the followlowing coal out-crop which resembles the Pratt seam, though it is believed to be (33) of the *General Section :*

Ont-Crop in the N. E. ¼ of N. E. ¼ of S. 19, *T.* 16, *R.* 4 *W.*

(5)	*Shale;* visible	8 ft. 0 in.
(4)	COAL SMUT	5 in.
(3)	*Slate*	2 in.
(2)	COAL SMUT	2 ft. 3 in.
(1)	*Fire clay;* may be a parting.	

On Wolf Creek, in the N. W. ¼ of S. 19, T. 16, R. 4 W., there is the following out-crop, it is probably of (30) of the *General Section* :

Out-Crop on Wolf Creek,
in the N. W. ¼ of S. 19, *T.* 16, *R.* 4 *W.*

(10)	*Shale;* hard, siliceous, bluff.	
(9)	COAL; cubical, rusty	5½ in.
(8)	*Slate*	⅛ in.
(7)	COAL; bony	6 in.
(6)	*Slate*	1½ in.
(5)	COAL	3 in.
(4)	*Slate;* blue	5 in.
(3)	MOTHER OF COAL	3 in.
(2)	*Slate;* hard	6 in.
(1)	*Sandstone.*	

Dip of this out-crop is 3° to 4° to the south-east. Up Wolf Creek, or SES. from this last coal out-crop, about 600 yards and some 100 feet above it, there is an other out-cropping of coal, which is likely of (33) of the *General Section*; if so, there should be between these two out-crops at least two other coal out-croppings.

Going back to Village Creek, there is an out-cropping of coal about fifteen inches thick, which forms the bed of the creek, at a ford in Mr. Eaton's field, near the center of S. 12, T. 17, R. 5 W. Running diagonally across the creek, just below and parallel to the ford, there is a *jump off* in the creek, which has been produced by the breaking off and raising of the coal of this seam below the ford. This coal out-crop appears to dip to the north-west. It has an underbed of fire clay, and is probably (32) or (30) of the *General Section.* No other out-crops of coal are known of along Village

Creek above this point until those of the Pratt seam, etc., of the south-east edge of the Warrior field are reached, though on the high ridges, or the divide between this creek and Five Mile Creek, there are to be seen out-crops of (37) and (38) of the *General Section.* The lower one of these seams, or the one of six inches thickness, which is known as the *guide seam*, crops out in the public road, on the side of a hill, in the N. E. ¼ of S. W. ¼ of S. 2, T. 17, R. 4 W., where it shows its full thickness and an underbed of fire clay from three to four feet thick. It also crops out along this same road, in the S. E. ¼ of S. E. ¼ of S. 2, T. 17, R. 4 W. The other one, the uppermost coal seam of this county, (39) of the *General Section*, is said to be eighteen inches thick, and to have been considerably surface worked in an out-crop in the S. E. ¼ of S. W. ¼ of S. 1, T. 17, R. 4 W.

The *Pratt Mines* comprise at present, as already stated, besides the *Drifts*, *Slope No.* 2, the *Shaft*, *Slope No.* 1, and the *Laura Slope ;* which are here named in the order that they are met with in going to the south-west from the Drifts.

Slope No. 2 is about one mile south-west of the Pratt Mines' Drifts, or is in the N. E. ¼ of S. W. ¼ of S. 17, T. 17, R. 3 W., and has, about 100 yards within it from its mouth, the following section of its coal seam :

Section of Pratt Seam in Slope No. 2 *of Pratt Mines, in the N. E.* ¼ *of S. W.* ¼ *of S.* 17, *T.* 17, *R.* 3 *W.*

(9)	*Shale;* hard, cover.	
(8)	*Slate;* soft, shaly	½ in.
(7)	COAL	7½ in.
(6)	*Slate;* hard and black	2½ in.
(5)	COAL	2 ft. 8 in.
(4)	*Slate;* clayey	3 in.
(3)	COAL	5½ in.
(2)	*Slate;* clayey and soft	5½ in.
(1)	*Fire Clay;* floor, hard.	

This slope was opened in 1879 and now has a daily output of about 375 tons of coal, with a capacity of 700 to 800 tons. The rooms are 80 feet x 300 feet and are separated by pillars twenty feet wide. It is on the branch railroad to *the drifts* and the coal cars are pulled out of the mines to the scales on top of the chute and thence dumped immediately into the Company's large cars standing on a side track of the branch railroad. The machinery at these mines consist of one double hoisting engine and drums, six two-flue boilers, one compressor and three large Knowles' pumps. The miners are altogether convicts. The seam in this slope shows plainly the flaggy or the *face and butt* structure of the coal.

The *Pratt Mines Shaft* or the "*Helen Shaft*" is about one and a half miles south-west of *Slope No.* 2 or is in the N. W. ¼ of S. 17, T. 17, R. 3 W. The coal seam in these mines,at two different points, has the following sections :

Sections of Pratt Seam in Pratt Mines' Shaft
or "Helen Shaft,"
in the S. E. ¼ of N. W. ¼ of S. 17, T. 17, R. 3 W.

		(1)	(2)
(7)	*Sandstones.*		
(6)	Coal	7½ in.	10 in.
(5)	*Slate*	1¼ in.	1 in.
(4)	Coal	3 ft. 6½ in.	3 ft. 10½ in.
(3)	*Slate;* soft	3 in.	3 in.
(2)	*Fire Clay;* reported	10 ft. 0 in.	10 ft. 0 in.
(1)	Coal; reported	5 to 6 in.	5 to 6 in.

No. 1 occurs in the main entry not far from the foot of the shaft.

No. 2 is in the second left side entry from the foot of the shaft.

In the coal (4), there are several thin sheets of mineral charcoal, some fourteen to fifteen inches from the bottom. This shaft is 204 feet deep and was finished in 1884. It is connected with *Slope No* 1 by an entry 3000 feet long for egress in case anything should happen to the shaft. The rooms are one hundred feet wide and are separated by twenty feet pillars, which are finally robbed. This shaft has now an out-put of 600 tons of coal per day, with a daily capacity of 1200 tons. These mines are worked entirely by convicts and the *Harrison Mining Machine.* This machine is handled by one man and is worked by means of compressed air. With it the coal is undermined to a distance of four feet four inches and the daily task of the machine man is to undermine ninety linear feet along the *face or butt* of the coal or about 400 square feet. This daily task, it is said, can be accomplished in about six hours. Capt. Johns, the mining engineer, says that some of his best machine men have cut with this machine 164 linear feet in a day or have undermined with it over 700 square feet in a day. This is nearly ten times as much as the best miners can undermine in a day, with a common pick. The coal mined with these machines is also of a better grade than that mined with the common pick, from the fact that, on account of the greater distance to which the seam is undermined, the coal can be gotten out much more lumpy and in much larger lumps. The coal cars are hoisted, by a double acting engine and drums, to the scales on the top of the shoot and thence dumped immediately into the Company's cars standing on an extension of their railroad from *Slope No.* 1. The other machinery in use at these shaft mines are one duplex Allison compressor, twelve two-flue boilers and five Knowles' pumps.

Just up and across the railroad from this shaft is a long double row of coke ovens. Just south-west of the shaft mines, there is said to be a cross fault; along which the south west side has received a down-throw of 160 feet.

Slope No. 1 is about one mile south-east of the "Helen Shaft" or is in the N. E. ¼ of N. E. ¼ of S. 30, T. 17, R. 3 W. It is the *Pratt Mines* proper, as it is in the town of Pratt Mines and the Company's offices and commissary are near it. It was opened in 1878 and was the original mine of the Pratt Mines which have gradually and steadily increased to their present proportions or from an out-put of about two hundred tons of coal per day, in 1879, to a daily out-put now of 2500 tons and a daily capacity of 3500 tons. The *Pratt Seam* in *Slope No.* 1, has about the following section:

Section of Pratt Seam in "Slope No. 1," in the N. E. ¼ of N. E. ¼ S. 30, T. 17, R. 3 W.

(5) *Shale;* cover.
(4) COAL .... 10 in.
(3) *Slate* .... 2 in.
(2) COAL .... 3 ft. 10 in.
(1) *Fire Clay;* underbed.

Separate analyses, which are published in the State Geologist's report for 1879, have been made of average samples of the coals both above and below the slate parting and of the slate parting itself, of the coal seam in *Slope No.* 1, with the following results :

	(1)	(2)	(3)
Specific Gravity	1 330	1.278	1.988
Sulphur	1.224	.612	——
Moisture	1.474	1.529	1.621
Volatile Matter	32.288	30.683	11.719
Fixed Carbon	59.503	63.683	23.839
Ash	6.735	4.102	62.821
	100.000	100.000	100.000

No. 1 represents an average sample of the coal above the slate parting.

No. 2 represents an average sample of the coal below the slate parting.

No. 3 is a proximate analysis of an average sample of the slate parting.

An exhaustive analysis was made of the *ash* of the *slate parting* with the following results ;

Silicic Acid	63.155
Ferric Oxide	6.383
Alumina	22.884
Lime	.703
Magnesia	.536
Potash	2.164
Soda	1.143
Phosphoric Acid	2.564
Sulphuric Acid	.145
Sulphur, Combined	.051
Chlorine	trace.
	99.728

The coal seam in this slope has a dip of about 4½° to the north-west. There are about 200 men employed at this slope, and the out-put is about 600 tons of coal per day. The machinery in use here consists of one double hoisting engine and drums, six boilers, two Knowles' steam pumps with a daily capacity of 500,000 gallons, and an endless rope, which can be extended to an indefinite length. This endless rope is the invention of Capt. L. W. Johns, the mining engineer, and is said to be the only one of its kind in use in this country. It is claimed that it will do the hauling of fifty mules. Near this slope there is a long double row of coke ovens, each of which is twelve feet in diameter.

The *Laura Slope* is on the out-crop of the Pratt seam, on the opposite side of Village Creek from the other mines, or about three-fourths of a mile south-west of Slope No. 1, or in the S. W. ¼ of S. W. ¼ of S. 30, T. 17, R. 3 W. In this slope, the coal seam has the following section:

Section of Pratt Seam in Laura Slope, in the S. W. ¼ of S. W. ¼ of S. 30, *T.* 17, *R.* 3 *W.*

(7)	*Sandstone;* hard, gray, micaceous, cover.	
(6)	Coal	10 in.
(5)	*Slate;* hard, black	2 in.
(4)	Coal	3 ft. 8 in.
(3)	*Fire Clay;* fossiliferous	2 in. to 2 ft. 0 in.
(2)	Coal; variable	1½ in. to 1 ft. 0 in.
(1)	*Fire Clay;* underbed.	

This slope is, now at the time of writing, the newest of the *Pratt Mines,* and has been in complete equipment only a few months. It has a double track and a floored manway, and is a beautiful piece of engineering and mechanical workmanship, in the construction of which neither labor nor money have been spared. Near the mouth of this slope, or on the out-crop, the seam of coal has a dip of about fifteen feet to the 100 feet to the north-west, but, in about 300 feet within, it has flattened down to as little as five feet to the 100 feet to the north-west. In this mine, as in all of the mines of the Pratt Coal and Iron Company, the most improved machinery for the mining and hoisting and moving of coal on a large scale are in use, and in all of them the ventilation seems to be perfect; the work is done in such a way and the mines are kept in such shapes and conditions, as to show plainly that they are under the guidance of one who is *at home in the mines* and who knows what is best, and has at heart the interest of the Company, and the safety and welfare of the miners.

This great corporation, the Pratt Coal and Iron Company, will soon sink an other slope and a second shaft. The new slope will be called the *Enoch Slope* in honor of the President, Enoch Ensley, and the new shaft will be christened the *Napoleon Shaft*, doubtless in honor of Napoleon Hill, of Memphis, one of the stockholders.

The *Enoch Slope* will be driven in on the out-crop of the Pratt Seam, one and one-half miles south-west of the Laura Slope. It will have all of the most modern appliances for mining coal on a large scale, and will have, so it is said, a daily out-put of 800 to 1,000 tons of coal.

The *Napoleon Shaft* will soon be commenced. It will be 300 feet deep, and will have, as reported, a capacity of 1200 to 1500 tons of coal per day. Its machinery will be of the latest and most improved patterns.

As we go to press, we understand that the "Pratt Coal and Iron Company" has been absorbed by the "Tennessee Coal, Iron and Railroad Company." These combined corporations have now, so it is said, five furnaces and fifteen hundred coke ovens in active operation. They will, doubtless, soon form one of the greatest, if not the greatest, coal and iron producing company in the world.

Not far from the Laura Slope, in the edge of Village Creek, just below the crossing of the Company's railroad, or in the N. W. ¼ of N. W. ¼ of S. 30, T. 17, R. 3 W., there was discovered by Capt. L. W. Johns, in the spring of 1885, an escape of natural gas, at eight or ten different points, within a radius of five to six feet. This gas has been bubbling up steadily, without any intermission, ever since it was first discovered, though the points of escape frequently shift from place to place within a radius of a foot or so. It comes up from between the strata, or along the planes of stratification of shaly and flaggy sandstones, which have a dip on the out-crop of some 20° to 25° to the west. In a rude experiment, of an old powder can, with the bottom knocked out, which was placed over one of these bubbling points, the gas, on the complete expulsion of the air from the can, burnt readily at a hole in the top of the can, with a very hot flame of an orange color.

Some 300 yards up the creek, or east of this escapement of gas, is the top of an anticlinal fold, and, between the two points, there are shoals along the creek of a gray micaceous sandstone. Sandstones, which are doubtless of the Coal Measures, are said to show along the creek for one-fourth of a mile above the crest of this anticlinal fold, before the first limestone, which is most probably a *Silurian rock*, is reached.

On the side of the public road from Pratt Mines to Wheeling, there is, two and one-half miles south-west of Pratt Mines' P. O., or Slope No. 1, an out-cropping of a thick seam of coal, with about twelve inches of coal smut some fifteen feet under it. These out-crops are about perpendicular, and are likely of the main Pratt Seam and its separated under part. Still farther to the south-west, some three-fourths of a mile, there is an other out-cropping of thick coal, which has been considerably surface worked, and which may be of this same Pratt Seam. Several other out-crops of coal are reported to be in this immediate neighborhood. Still farther down the public road, to the south-west, some half-mile, there is a ridge running NEN. and SWS., with a capping of a confused pile of loose conglomerates like those at the base of the Coal Measures, or the *Lower Conglomerates.*

These rocks are near a fault, and, doubtless, have been subjected to great disturbances, and hence their confusion. Scattered over the surface next to the base of this ridge, on the east or south-east side, there are loose fragments of *Knox chert*, hence there must be a fault between them and the ridge in which all the sub-carboniferous rocks have been engulfed. There is also, probably, a fault on the opposite side of this ridge of conglomerates, and most likely there is a cross-fault just above or north-east of it. Next to the cherty fragments, on the south-east side of this ridge, there are two ridges of *Clinton rocks*, which have a very red soil, and have scattered over them pebbles of ferruginous sandstone. In these ridges, along the road, the *red ore* outcrops are covered by debris. Still farther to the south-west, along the Wheeling road, or in the S. E. ¼ of N. E. ¼ of S. 10, T. 18, R. 4 W., there are more conglomerates. They are in regular seams or strata, which have a dip of 60° to 75° to the south-east, and a strike of S. 30° W. These conglomerates appear to have but very few pebbles, which are confined chiefly, if not altogether, to the under portion of the conglomerates. Many of these conglomerates are very fine-grained or *buhrstone* looking rocks. They form the edge of the coal measures, and are believed to be the *lower conglomerates* or *millstone grit*, and are cut through by a branch, which, as a very unusual thing, rises in the Coal Measures and flows into the anticlinal valley. Down this branch some fifty yards, within the anticlinal valley, from the above conglomerates, there are some light gray siliceous limestones, with much calcite in streaks and spots. Still farther to the south-west, about one and a half miles, and apparently several hundred yards within the Coal Measures, are the coal mines of the *Woodward Iron Company*.

The Woodward Iron Company's Coal Mines consist of one slope down on the *Pratt seam*, in the N. W. ¼ of S. W. ¼ of S. 16, T. 18, R. 4 W. It has been in operation about three years, and for the year ending July 1, 1885, it had an out-put of 102,588 tons of coal, and, barring all accidents, will have an out-put of from 105,000 to 110,000 tons of coal for the present year, ending July 1, 1886. The coal cars are hoisted by steam from the foot of the slope to the scales on top of the shoot, and thence the coal is dumped immediately into the company's cars standing on the terminus of their railroad. The Pratt seam, in its out-crop at these mines, is perpendicular for a distance down of 170 feet, when it suddenly bends, with a radius of only five to six feet, to a dip of about 30° to 40° to the northwest, and then flattens in 100 feet to a dip of only 12° to 15°, and in 200 feet to a dip about 7°, after which, or beyond 200 feet from the sudden bend, the flattening becomes very gradual. As can be seen in the air-shaft, which is sunk down on the out-crop, the coal for twenty-five to thirty feet, while perpendicular, is said to have been squeezed out to a thinness of not more than twelve inches, but, strange to say, immediately at the sharp bend, it is of extraordinary thickness. The slope strikes the coal seam right at this sharp bend, and, though eight feet of thickness of coal was taken out, the floor of the slope is still coal. This extraordinary thickness, however, is confined immediately to the sharp bend, for just below this bend the seam is of its regular thickness and has a smooth cover of hard unbroken shale. The coal seam is, therefore, continuous around the curve, and though, at this sharp bend, the strata are broken up some, they are not as much so as might be expected. The grade of the slope, before it strikes the coal, is almost the same as the dip of the coal just below the bend, but after it strikes the coal it follows the coal, and hence has an ever changing grade until the uniform dip of 4° to 5° to the north-west of the coal seam is reached. The mouth of this slope is in strata just under the coal (33) of the *General Section*, and hence it passes through the coals (33), (34), (35) and (36) of the *General Section*. The following sections were taken of the coal seam at three different places in these mines:

Section of Pratt's Seam in Woodward Iron Company's Mines, in the N. W. ¼ of S. W. ¼ of S. 16, T. 18, R. 4 W.

		(1)	(2)	(3)
(10)	*Shale;* hard, fossiliferous, roof.			
(9)	*Slate,* soft, clayey	7 in.	5 in.	6 in.
(8)	COAL; very fine	10 in.	1 ft. 0 in.	11 in.
(7)	*Slate;* hard, black	2 in.	3 in.	2 in.
(6)	COAL; good	7 in.	7 in.	9 in.
(5)	*Slate, Rash*	1½ in.	4 in.	2 in.
(4)	COAL	2 ft. 8 in.	2 ft. 10 in.	2 ft. 10 in.
(3)	*Fire Clay*; about	6 ft. 0 in.	6 ft. 0 in.	6 ft. 0 in.
(2)	COAL	10 in.	10 in.	10 in.
(1)	*Fire Clay;* underbed.			

Section No. 1 occurs at the foot of the steep grade, or about 100 yards within from the sharp bend; *No.* 2 between the second and third side entries; and *No.* 3 at the head of the slope or main entry on July 29, 1885, or about 1,000 feet within from the mouth of the slope. The head of the slope, or main entry, is advanced every night, and side entries are made to branch off to the right and left every 200 to 225 feet. In the second and third side entries, on the left, the seam of coal falls about three feet within a distance of about twenty inches, and, after about 150 yards across the sunken portion, it again as suddenly rises to its former horizontal position. The edges of this sunken strip do not appear to be parallel, as the north-west edge runs across the entry in a north-west and south-east direction, while the south-east edge runs almost north and south. The rash or dirty parting, (5) of the sections above, grows thicker as you go to the south-west, or thins out towards the north-east, and, as the roof also gets better in this north-east direction, most of the mining has been done in the side entries on the right or east side of the main entry. In these mines, there are to be seen numerous *miners pots* and *hog backs*, which occasionally extend up into the roof as much as two and three feet. The water of the mines is conducted, by natural drainage, into a cistern or pool, and from thence it is pumped out into a tank by steam and used to run the engine. The coal out-put of this mine is all consumed by the Company, and, with the exception of the comparatively little coal that is used for heating, steaming and blacksmithing purposes around the Company's works, it is all crushed, washed and coked by them for iron-ore smelting in their furnace. The shale cover and fire-clay underbed, in these mines, are both full of beautiful plant impressions.

The out-crops of the Pratt Seam and accompanying strata extend to the south-west, from these mines, about a mile, when they run up against *Lower Silurian* rocks of the anticlinal valley, along a fault. On the line of this fault, near Mr. J. V. Huey's, in the S. E. corner of the S. W. ¼ of S. 20, T. 18, R. 4 W., the out-crops of the strata are very much broken up, and appear to be thrown together in a confused pile. Mr. Huey dug two wells, about 100 feet apart, near this fault, and in each struck the greatest abundance of water, but it was so strongly impregnated with *sulphates* as to unfit it for any domestic purposes. He finally dug a third well, about twenty-five feet farther in on the Coal Measures, and succeeded in getting plenty of good freestone water. The strata, in their out-crops near these wells, seem to be more than perpendicular, or to have been bent over on themselves until they dip some 98° to the south-east. *Well No.* 1, is said to have been sunk down on the out-crop of a seam of coal, the smut of which, on the surface, was not over three inches thick, but which so thickened as to become, as reported, at the bottom of the well, which is twenty-two feet deep, four feet in thickness, of good coal. *Well No. 2*, is south-west of *Well No.* 1, and, though nearly on the same line of out-crops, its strata are not quite perpendicular, and are said to form the following section :

Section of "Wetl No. 2," of Mr. J. V. Huey's, in the S. E. corner of S. W. ¼ of S 20, *T. 18, R.* 4 *W.*

(3) *Clayey Loam*.................................17 ft. 0 in.
(2) *Sandstone*, COAL. The sandstone is carbonaceous and contains 4 to 5 streaks of coal, each of from 4 to 5 inches thick.......................................18 ft. 0 in.
(1) *Sandstone;* hard and gray to bottom of the well..7 ft. 0 in.

Well No. 3, is said to be in a yellow sandstone, with the exception of the lower ten feet, which is in blue shale.

In the public road, some 300 yards north-east of Mr. J. V. Huey's, there is an out-cropping of coal smut which is about six inches thick, and may be of the same seam as occurs in *Well No. 1.* In a gully just south-west of Mr. Huey's, there can be seen, in some half dozen places, coal smut from five to six inches thick. These out-crops may be of the same coal seam as the one in the public road and in *Well No.* 1, and are believed to be of the Pratt Seam, as it is squeezed out and broken up along the line of fault. The coal out-crops in the gully were not of a continuous seam or seams, but were in places in pockets and in other places in streaks, or were along with strata which had been very much disturbed and broken up and had no regular dip or strike. These strata in their out-crops, in places, were so bent over on themselves as to dip about 60° to the south-east. The lowest down the gully of these coal out-crops, had just under it a siliceous and bituminous limestone, with streaks of calcite and with black carbonaceous streaks and surfaces. About 150 yards S. 50° W. from this last coal out-crop, there is an old well in which the water is said to be *hard*, and about 150 yards still farther to the south-west, on the same line, there is a large and solitary limestone boulder, in the field near Mr. Sol. Huey's house. In front of this house, which is on the section line, in the north-west corner of S. 29, T. 18, R, 4 W., there is an old pit which is sunk down on the out-cropping of a seam of *black band iron ore* with a covering, so it is said, of *cannel coal*. On the out-crop, the *black band* and the *cannel coal*, are said to have been each eighteen inches thick; but at the bottom of the pit, which is thirty-five feet deep, it is reported that the *black band* is six feet six inches and the *cannel coal* is only six inches thick. At this pit, the strata appear to be bent over only a little or until they dip on the out-crop about 98° to the south-east. Their strike appears to be about S. 50° W. This *black band ore* is believed to be in the thick bed of shale just over the Pratt Seam, though it may be of the Pratt Seam itself. It was seen, or recognized, in no other place in this county. It is said that from eight to ten feet under this *black band ore*, there is a seam of coal with an out-cropping of about six inches thick, and that, from twenty te twenty-five feet over this *black band ore*, there is an other seam of coal which has an out-crop of only six inches, but which thickens to eighteen inches on being dug down into only three feet. Up the branch, or north about one-fourth of a mile from this pit on the *black band ore*, there is an out-cropping of a seam of coal, which is reported to be about eighteen inches thick. Between this coal and the *black band*, the strata in their out-crops do not appear to have any regular dip. Mr. Sol. Huey had a well between his house and the pit down on the *black band ore*, which was sunk down on the out-crop of the *six inch seam* of coal from eight to ten feet under the *black band*, and which, previous to the digging of the pit down on the *black band ore*, furnished plenty of water, but after the digging of said pit, the well went completely dry. Mr. Sol. Huey's present well is some seventy-five to eighty yards south-west of the pit down on the *black band ore*, and is principally in a deep blue shale with streaks or *knife edges* of coal. Near the line of this fault, here along the south-east edge of the Coal Measures, in front of Mr. M. Robertson's house, in the north-east corner of the S. E. ¼ of N. E. ¼ of S. 30, T. 18, R. 4 W., there is an out-cropping which is nearly two feet in thickness, of alternate thin streaks of slate and coal, and, some twenty-five feet from this coal out-cropping, there is scattered over the surface loose pieces of *Knox chert*. Just north-east and south-west of this coal out-crop, the *Lower Silurian* rocks seem to have pushed themselves up into the Coal Measures, or the line of fault between them and the Coal Measures, seems to be in curves. *Pleasant Ridge Church*, which is not far from the center of S. 30, T. 18, R. 4 W., is near the line of this fault, and around the church there is scattered over the surface some small rounded flint pebbles, which doubtless have come from the weathering of conglomerates. West of this church about 200 yards, at the spring, there are some masssive sandstones, which have a dip to the north-west; and south of the church, several hundred yards, there is a ridge of *Knox chert* with an occasional specimen of limonite. The water of the above spring is covered with an oily scum and hence may come from a coal seam. This church cannot be very far from where the fault, which cuts off or divides the *Little Basin* from the *Big Basin*, enters the Coal Measures.

Save along the the south-east edge of the Warrior coal field and near the river, there are no coal out-crops known of on the divide between Village and Valley creeks proper, except two or three on the waters of Rock Creek. Drillings or borings have been made on this divide, at *Sulphur Spring Church* and on *Camp Branch* seven and ten miles west of Birmingham. These drillings or borings are respectively

543 feet and 532 feet deep. Sections have been given of them by the State Geologist in his report for the year 1875. The drilling at Sulphur Spring Church commences in strata between (38) and (39) of the *General Section* and the one on Camp Branch, in strata, it is believed, between (29) and (30 of the *General Section,* hence there must be a fault or faults between the localities of these two borings in which there has been a vertical displacement of strata or a *down-throw* of the sunken area side or Sulphur Spring Church side of some 350 feet. There are also believed to be *cross faults* along near Village and Valley creeks, which have the general north-west and south-east direction of these creeks. The vertical displacements along these cross faults are not very great and are thought to diminish from the south-east to the north-west.

In the public road, on the high divide, in the N. E. ¼ of N. W. ¼ of S. 36, T. 16, R. 5 W., nearly two hundred feet above the river, there is an out-cropping of coal about eighteen inches thick, with an underbed of fire clay about two feet thick. It is likely (34) of the *General Section.*

On a branch, near the river, about one mile south of the mouth of Village Creek, or in the N. W. ¼ of N. W. ¼ of S. 33, and the S. W. ¼ of S. W. ¼ of S. 28, T. 16, R. 5 W., are the coal out-crops which are known as the *Calvary Williams' Coal Beds.* The following sections are of these coal out-crops:

Sections of Calvary Williams' Coal Beds,
in the N. W. ¼ of N. W. ¼ of S. 33, T. 16, R. 5 W.

			(1)	(2)
	(14)	*Shale.*		
Upper Group.	(13)	*Mother of* COAL	1½ in.	
	(12)	COAL	1 ft. 4 in.	1 ft. 3 in.
	(11)	*Clay Slate*	2½ in.	2 in.
	(10)	COAL	6 in.	4 in.
	(9)	*Slate*	5 in.	3½ in.
	(8)	COAL	2 ft. 3 in.	2 ft. 3 in.
	(7)	*Slate;* parting	1 ft. 8 in.	10 in.
	(6)	COAL; about	3 ft. 2 in.	4 ft. 0 in.
	(5)	*Fire Clay;* underbed.	10to12ft.0 in.	10 ft. 0 in.
	(4)	*Sandstones, Slates;* about		
L.G.	(3)	COAL; with much charcoal	2 ft. 6 in.	COAL 5 to 6 ft. 0 in.
	(2)	RASH; may be in places all *coal.*	1 ft. 8 in.	
	(1)	*Slate;* visible	1 ft. 6 in.	

No. 2 is a section of these coal out-crops by the State Geologist and was published in his report for 1879-80.

The *upper group* is exposed in the west bank of the branch about 150 yards from its mouth, and on the side of the ridge about 200 yards farther up the branch or north, and some fifteen feet higher. In this out-cropping on the side of the ridge, the lower seam of this *upper group*, or (6) of the above sections, is about three feet six inches thick. In the bed of the branch, just opposite to this last out-cropping or about seventy-five yards NEN. of it, and some twelve feet lower, with shales and sandstones between, there is an out-cropping of the *lower group* as given in *No.* 1 of the above sections. This *lower group* here in the bed of the branch, is said to have been cut through in one place and to have measured six feet; if such is a fact, then (1) of *No.* 1 of the above sections would have to be a parting, which we are quite sure is not the case. There is said to be a thick out-cropping of coal in the bed of the river, just at the mouth of this branch, which is under nine feet of water at a low stage of the river. It is likely of this *under group*, though it may be of the *upper group*. These coals are the *upper* and *lower groups* of (28) of the *General Section*, or of the Corona, etc., coal of Walker county. They are the same seams as the Van Hoose *upper* and *lower* seams of *Franklin's bend*, Walker county. The coal of the *upper group* is cubical and much of it, on the out-crop, is rusty; it is a hard, firm coal, though not altogether as much so as the coal of the *lower group*. The following analyses will represent the quality of the coals of these out-crops:

	(1)	(2)
Specific Gravity	1.391	1.312
Sulphur	.521	.604
Moisture	4.175	1.525
Volatile matter	22.415	26.170
Fixed carbon	62.482	66.020
Ash	10.928	6.285
	100.000	100.000

No. (*1*) is an analysis of an average sample of the lower seam of the *upper group* or of (6) of the above sections.

No. (*2*) is an analysis of an average sample of the main bench of the *lower group* or of (3) of the above sections

These coals are in waves from the north-west to the south-east, though they have a general dip of about 3° to the south-east.

Still higher up the branch or north about one-fourth and one-half miles of any of the above coal out-croppings, there are other out-croppings of coal seemingly thin, which are likely of the *lower group* of the above out-crops or of underlying seams.

About one-quarter of a mile north-west of *Calvary Williams' coal beds*, on the opposite side of the river, in the south-east corner of S. 32, T. 19, R. 5 W., there is an out-cropping of coal , which is some fifty feet above the river, that is probably of the *upper group* of the Calvary Williams beds; and some eighty feet above the river, in the north-east corner of the N. W. ¼ of S. 34, T. 16, R. 5 W., there is an other out-cropping of coal which shows a parting of slate and has just above it a strong chalybeate spring that perhaps has its origin in the coal seam. It is likely (32) of the *General Section*. Some sixty feet above the river in the S. E. ¼ of S. E. ¼ of S. 33, T. 16, R. 5 W., there is an other strong chalybeate spring which perhaps also comes from a seam of coal, and about two hundred yards north-east of this last spring and ten feet above it, there is said to be an out-crop of coal which is now covered by debris; it is likely the seam from which the last spring flows or (13) of the *Gemeral Section*. In the same *forty* as this last coal out-cropping, but several hundred yards to the south-west of it, there is an other showing of coal, which is some forty feet above the river, from which out-cropping boat loads of coal have been raised and hence it is doubtless of a thick seam. It is probably (30) of the *General Section*. On a branch SES. from this last out-crop about three-quarters of a mile, there is said to be a showing of coal about four feet thick. In the river about one-half mile above the *Fish-trap ford*, which is on the half-mile line of S's 33 and 34 and the township line between T's. 16 and 17, R. 5 W., there is said to be an out-cropping of coal which is under nine feet of water at low stages of the river, and just below the ford, there is a coal out-cropping which is reported to be three feet thick and to have no partings. Still lower down the river, about one-quarter of a mile, there is said to be more coal in the river. These out-crops in the river are of the *upper* and *lower groups* of the Calvary Williams' beds.

In the public road, on the west side of the river, in the N. W. ¼ of N. W. ¼ of S. 4, T. 17, R. 5 W., and some eighty feet above the river, there is a showing of coal smut about twelve inches thick. It is probably (21) of the *General Section*. In Vaughn's branch, in the N. W. ¼ of S. W. ¼ of S. 32, T. 16, R. 5 W., there is the following out-crop:

Out-Crop on Vaughn's Branch,
in the N. W. ¼ of S. W. ¼ of S. 32 T. 16, R. 5 W.

(4) *Shale.*
(3) Coal; with thin streaks of slate................1 ft. 9 in.
(2) *Slate*.................. ....1 ft. 0 in.
(1) Coal; with much mineral charcoal ....2 feet 0 in.

In one place in this out-crop, the upper bench of coal was separated from the lower by about twelve feet of slate, it gradually having risen this distance within ten or twelve feet and then gradually resumed its normal position, while the lower bench held its proper place. There is an other coal out-cropping about sixty yards higher up the branch, and others about 100, 300 and 600 yards down the branch; they are all of the same seam, (28) of the *General Section*, as Cal. Williams' beds. On *Lick Creek*, on the opposite or east side of the river, in the S. W. ¼ of the S. W. ¼ of S. 9, T. 17, R. 5 W., and some seventy-five feet above the river, there is an out-cropping of coal with a cover of debris. Lower down the creek, or in the N. W. ¼ of S. W. ¼ of the same section, and some sixty feet above the river, there is the following out-cropping:

Out-Crop on Lick Creek,
in the N. W. ¼ of S. W. ¼ of S. 9, T. 17, R. 5 W.

(5)	*Clayey Loam.*	
(4)	COAL	1 ft. 3 in.
(3)	*Slate*	1½ in.
(2)	COAL	1 ft. 7 in.
(1)	*Slate.*	

Still lower down this creek, or in the N. E. ¼ of S. E. ¼ of S. 8, T. 17, R. 5 W., some thirty feet above the river, there is an other showing of coal. These out-crops are doubtless all of different seams, or of (31), (30) and (29) of the *General Section.*

In the road running along the south-east bank of the river, in the N. E. ¼ of S. W. ¼ of S. 8, T. 17, R. 5 W., there are out-crops of coal which are about thirty feet, fifty-five feet and sixty-five feet above the river, and are likely of the same seams as the two lower out-crops on Lick Creek, (29) and (30) of the *General Section.* On a branch in the N. W. ¼ of S. W. ¼ of S. 8, T. 17, R. 5 W., there is a showing of about twelve inches of coal which is said to be of a seam that is, at the least, three feet in thickness and is probably of the same seam as the upper of the three out-crops above in the road. In this last branch, near its head and some 150 feet above the coal just mentioned or more than 200 feet above low water in the river, there were seen loose pieces of washed coal, which must, of course, have come from an out-cropping still higher up the branch, likely (33) of the *General Section.* On the north side of the river, in the S. E. ¼ of S. W. ¼ of S. 6, T. 17, R. 5 W., and some fifteen feet above the back water from Salter's mill-dam, there is the *Hanby old coal mine.* This mine consisted of a drift, or a shallow shaft, at the head of a short ravine, into the upper or lower group of (18) of the *General Section.* This drift, or shaft, has been completely hid by a slide, and the only traces which are left of the old mine are some cedar posts of the short tramway to the river, which are perfectly sound. In the bed of the river, some 200 yards below the above mine, under eight to nine feet of water, there is said to be an out-cropping of a thick seam of coal, which is of the *lower group* (28) of the *General Section*, from which boat loads of coal have been raised and floated down the river. In a bluff at the mouth of a branch, opposite to this coal in the river and some twenty-five feet above it, there is visible about twenty inches of coal, which is of the *upper group* of the thick seam (28) of the *General Section.* Up this branch, or north-west about 200 yards from the river and about ten feet above the river, there is an out-cropping of the *lower group* of (28) of the *General Section*, which is probably the coal in the river, as follows:

Out-Crop in the S. W. ¼ of S. W. ¼ of S. 6, T. 17, R. 5 W.

(5)	*Shale.*	
(4)	COAL; about	1 in.
(3)	*Slate*; bluish	1 ft. 4 in.
(2)	COAL	2 ft. 4 in.
(1)	*Fire Clay;* visible	3 ft. 0 in.

Still farther up the branch, or to the north-west about 125 yards, in what is known as the *Boat Gundle Hollow*, there is, in a bluff, the following section:

Section of a Bluff in "Boat Gundle Hollow," in the S. W. ¼ of S. W. ¼ of S. 6, T. 17, R. 5 W.

(15)	*Shale, Sandstone, Debris.*		
(14)	COAL	Upper Group.	4 in.
(13)	*Slate*		¼ in.
(12)	COAL		1 ft. 4½ in.
(11)	*Slate*		6 in.
(10)	COAL		4 in.
(9)	*Slate*		3 in.
(8)	COAL		2 ft. 4 in.
(7)	*Slate;* parting		2 ft. 6 in.
(6)	COAL; Lower Bench		7 in.
(5)	*Fire Clay, Shale, Debris;* about		12 ft. 0 in.
(4)	COAL	L. Gr'p.	1 in.
(3)	*Slate*		1 ft. 4 in.
(2)	COAL		2 ft. 4 in.
(1)	*Fire Clay.*		

These out-crops of coal are of the same, *upper* and *lower groups*, as Calvary Williams' upper and lower coal beds, of

(28) of the *General Section.* The lower one is about fifteen feet above the mill pond or river. Up a branch, some 150 yards E N E. from this bluff, or in the S. E. ¼ of N. W. ¼ and N. E. ¼ of S. W. ¼ of S. 6, T. 17, R. 5 W., there is an other out-cropping of the thicker or *upper group,* which is known as the "*Hanby Coal Bed.*" It has, on the out-crop, about the following section:

Section of "Hanby Coal Bed" in the S. E. ¼ of N. W. ¼ and N. E. ¼ of S. W. ¼ of S. 6, T. 17, R. 5 W.

(11)	*Debris.*	
(10)	*Sandstone, Shale;* about	5 ft. 0 in.
(9)	COAL; black and shiny at bottom; upper part contains much mineral charcoal	1 ft. 10 in.
(8)	*Slate*	6 in.
(7)	COAL	4 in.
(6)	*Slate*	1½ in.
(5)	COAL	1 ft. 7 in.
(4)	*Slate*	streak.
(3)	COAL	2 in.
(2)	*Slate*	3 ft. 0 in.
(1)	*Sandstone.*	

This out-cropping is some ten feet higher than the out-crop of the same coal seam in the bluff at the head of *Boat Gundle Hollow.* At this coal bed there are two piles of coal, of some 200 bushels each, which are said to have been dug some thirty-six to thirty-seven years ago, to boat to Mobile, and though the coal has been lying out in the weather all of this time, it has suffered, seemingly to the naked eye, but very little from weathering, and much of it is still in lumps.

On a branch near the half-mile and township lines of S. 6, T. 17, R. 5 W., there is an out-cropping of coal which is twenty-eight inches thick, and which is likely the *lower group* of the seam of Calvary William's beds, or (28) of the *General Section.* On Dry Creek, in the S. W. ¼ of N. W. ¼ S. 29, T. 16, R. 5 W., there is a thin showing of coal from three to four inches thick, and in a gully near the public road, some three-fourths of a mile south-west of this last out-crop, or in the N. E. corner of the N. W. ¼ of S. 32, T. 16, R. 5 W., there is an other showing of coal. This last coal is about two feet in thickness, and, in the public road, several hundred yards south of it, and thirty feet lower, there is an other showing of coal smut, which is from six to eight inches thick, and which, from the south-east dip, may be of the same seam as the last out-crop. The seams of these out-crops are probably, (28) and (27) of the *General Section.* In a bluff on Skelton's Creek, in the N. W. ¼ of N. E. ¼ of S. 36, T. 16, R. 6 W., with a cover of debris, there is an out-cropping of coal with a slate parting, which may be of a thick seam, perhaps (26) of the *General Section.* On a branch of Skelton's Creek, near Mr. Nelson Skelton's house, or in the S. W. ¼ of S. 36, T. 16, R. 6 W., there occur the following coal out-crops:

Out-Crops in the S. W. ¼ of S. 36, T. 16, R. 6 W.

		(1)	(2)
(8)	*Debris.*		
(7)	*Sandstone Shale;*	about 20 ft. 0 in.	25 ft. 0 in.
(6)	COAL	1 ft. 3 to 4 in.	1 ft. 3 to 4 in.
(5)	*Slate*	5½ in.	5 in.
(4)	COAL	2 ft. 10 in.	2 ft. 8 to 9 in.
(3)	*Slate*		1 in.
(2)	COAL		2 in.
(1)	*Fire Clay* fossiliferous.		

These coal out-crops are the *upper* and *lower groups* of the same seam, (28) of the *General Section.* No. (2), is some 400 yards higher up the branch, or to the south-east of No. (1), and is on some twelve feet higher ground. The general dip is to the south-east, which would make these two coal groups about 15 feet apart. The lower of these out-crops, No. (1), is about forty-five feet above the mill pond, or the river above Salter's Mill. In the bed of the branch, about half-way between these two coal out-crops, there is an other in which a very bituminous and black coal is visible to a thickness of nineteen inches. It is likely the under seam of the upper group. The coal of the other two out-crops are dry and cubical, though they are all parts of the same seam. The following section, given by Prof. Tuomy, in his First Biennial Report, on page 86, of the out-crop on the hill descending towards the ferry, is probably of this *upper group:*

(5)	COAL	1 ft. 3 in.
(4)	*Shale*	.5½ in.
(3)	COAL	1 ft. 10 in.
(2)	*Shale*	1 in.
(1)	COAL	3 in.

In the *Atwood's* old ferry road, now the Salter's Mill road, about one-half mile south-east of *No.* (1) of the above sections, and some fifteen feet above it and seventy feet above the mill pond, or river above Salter's mill-dam, there are two out-crops of a seam of coal, which are seemingly about three feet in thickness and about thirty feet above the *upper group*, of which the above is a section. They are probably of (30) of the *General Section.* In Mrs. Atwood's well, at her residence, on a hill which is capped with fossiliferous cherty pebbles, near the half mile line and southern boundary of S. 6, T. 17, R. 5 W., there is said to be, about twenty feet below the surface and hence about twenty-five feet above the river, a seam of coal which measures two feet in thickness. This coal is probably of the upper bench of the *upper group* of (28) of the *General Section.* In Mrs. Atwood's field, near the northern boundary and half-mile line of S. 7, T. 17, R. 5 W., there is a knoll, whose summit is perfectly black, or is the out-crop of a seam of coal which, though badly weathered, showed about the following section;

Coal Out-Crop near the Half-Mile Line and the Northern Boundary of S. 7, T. 17, R. 5 W.

(4)	COAL SMUT; top of knoll	8 in.
(3)	*Clay* or *Clayey Slate*	2 ft. 0 in.
(2)	COAL SMUT; about	2 ft. 10 in.
(1)	*Shale.*	

A part of (4) may have been washed off. This out-crop appears to dip to the south-east, it is some twenty-five feet above the river or mill pond and is doubtless the *lower group* of the same seam as the coal in Mrs. Atwood's well. About 300 yards NEN. from this knoll and from seven to eight feet higher, there is an other out-crop, in the road, which shows about two feet of coal smut and is probably of the same coal as that in Mrs. Atwood's well, or of the *upper group* of (28) of the *General Section.* Silas Salter's Mill is on the range line, in the extreme south-east corner of the N. E. ¼ of S. E. ¼ of S. 1, T. 17, R. 6 W. About a half-mile below the mill, in the western bank of the river, at the sharp bend, there is an out-cropping of coal along the water's edge, which at the time visited showed above the water about as follows :

Out-Crop in Western Bank of the River, in the N. E. ¼ of N. W. ¼ of S. 12, T. 17, R. 6 W.

(8)	*Shale*; hard, high bluff.	
(7)	COAL	1 ft. 6 in.
(6)	*Slate*	6 in.
(5)	COAL	5 in.
(4)	*Slate*	1 in.
(3)	COAL	½ in.
(2)	*Slate*	½ in.
(1)	COAL; to water's edge	1 ft. 0 in.

At this out-cropping, the coal is said to extend down to extreme low water mark, which is about two feet lower than when visited, and was felt with gig some six feet under the water. It is (26) of the *General Section.*

The following section, which is given in the First Biennial Report of Prof. Tuomy, is believed to be of the seam of coal just above that of the last out-cropping or of the *upper group* of (28) of the *General Section* :

(7)	COAL	5 in.
(6)	*Shale*	½ in.
(5)	COAL	1 ft. 1 in.
(4)	*Slate*	6 in.
(3)	COAL	5 in.
(2)	*Shale*	4 in.
(30)	COAL	1 ft. 6 in.

Near Mr. W. J. Salter's shop in the south-west corner of S. 6,T. 17, R. 5 W., there are several out-crops of coal about as follows·

Out-Crops in the S. W. ¼ of S. W. ¼ of S. 6, T. 17, R. 5 W.

		(1)	(2)	(3)
(7)	*Shale, Debris.*			
(6)	COAL	5 in.	6 in.	1 ft. 10 in.
(5)	*Clay Slate*	¼ in.	1 in.	1 in.
(4)	COAL	4 in.	1 ft. 0 in.	1½ in.
(3)	*Clay Slale*	½ in.	⅛ in.	1 in.
(2)	COAL; visible	1 ft. 11 in	1 ft. 2 in.	2 in.
(1)	*Clay;* visible about		1 in.	1 ft. 0 in.

These coal out-crops are about twelve feet above the river and are doubtless all of the *upper group* of (28) of the *General Section* or the same coal as the upper coal out-crop near Mr. Nelson Skelton's. Scattered over the ridges and knolls near these coal out-crops, there are some rounded flint pebbles, which may have come from the disintegration of conglomerates, and some 125 or 130 feet above these coal out-crops, there is, in the road near Mr. Wm. Vine's residence in the N. W. ¼ of S. 18, T. 17, R, 4 W., an out-cropping of coal, about fifteen inches thick, which appears to dip to the north-west. It is probably (32) of the *General Sections.* Farther up the road or to the north some three hundred yards and some twenty-five feet still higher, there is an other showing of coal smut about twelve inches thick, which is likely (31) of the *General Section.*

Under a bluff on Short Creek, and about twelve feet above the water of the creek, in the S. E. ¼ of S. E. ¼ of S. 18, T. 17, R. 5 W., there is an out-cropping of coal about fifteen inches thick with a thin streak of slate near the center. In the bed of this creek in the S W. ¼ of S. W. ¼ of S. 17, T. 17, R. 5 W., there is an other out-cropping of coal from which boat loads of coal are said to have been raised years ago. These last two coal out-croppings are likely of the *lower group* of (28) of the *General Section.* Under a bluff on the south bank of this same creek, in the N. W. ¼ of S. 20, T. 17, R. 5 W., there is visible about eighteen inches of the upper part of a coal seam which, at this point, has a dip of 4° to 5° to the south-east. This out-crop is probably of the *upper group* of (28) of the *General Section.* On the opposite or north side of Short Creek and doubtless of the same coal group as the last, there is in the road, in the S. W. ¼ of S. 17, T. 17, R. 5 W., a very imperfectly exposed and badly weathered out-crop of coal, about as follows:

Out-Crop in Road in S. W. ¼ of S. 17, T. 17, R. 5 W.

(8)	*Shale, Debris.*	
(7)	Coal Smut	1 ft. 3 in.
(6)	*Clay* or *Clayey Slate*	2 ft. 6 in.
(5)	Coal Smut	4 in.
(4)	*Clay* or *Clayey Slate*	7 in.
(3)	Coal Smut	1 ft. 2 in.
(2)	*Clay* or *Clayey Slate*	6 in.
(1)	Coal; bony, about	1 ft. 6 in.

This same seam of coal also makes its appearance in the following out-crop, under a bluff on Short Creek, in the N. E. ¼ of S. 20, T. 17, R. 5 W.

Out-Crop on Short Creek,
in the N. E. ¼ of S. 20, T. 17, R. 5 W.

(7)	*Shale, Sandstone,* bluffy	20 ft. 0 in.
(6)	Coal	6½ in.
(5)	*Slate*	1 in.
(4)	Coal	10 in.
(3)	*Slate*	1 in.
(2)	Coal	1 ft. 8 in.
(1)	*Slate, Debris*; to level of water	3 ft. 0 in.

Between these last two coal out-crops, there is in the bed of Short Creek, in the N. E. ¼ of N. W. ¼ of S. 20, T. 17, R. 5 W., an out-cropping of coal which is doubtless of the *lower group* of (28) of the *General Section.* It is said to be thick and to have furnished a boat load of coal, years ago. About one-hundred yards still farther up the creek or to the south-east of the out-cropping of the last section, coal is said to form the bed of the creek; it is doubtless of the same seam as the out-crop of the last section, or is the *upper group* of (28) of the *General Section.* Boat loads of coal are also said to have been raised from this out-cropping.

On a branch in the N. W. ¼ of S. W. ¼ of S. 20, T. 17, R. 5 W., there is the following out-crop:

Out-Crop in the N. W. ¼ of S. W. ¼ of S. 20, T. 17, R. 5 W.

(7)	*Shale;* hard and sandy, bluff	10 ft. 0 in.
(6)	COAL	6 in.
(5)	*Slate*	1 in.
(4)	COAL,	1 ft. 4 in.
(3)	*Slate*	6 in.
(2)	COAL	1 ft. 8 in.
(1)	*Fire Clay;* underbed.	

This out-crop is doubtless of (30) of the *General Section.* The dip is to the south-east. In the N. E. ¼ of S. E. ¼ of S. 20, T. 17, R. 5 W., in a deep hole in the bed of an other prong of the above branch, there is an other out-cropping of coal, from which boat loads of coal have been raised; and on the hill side, some five feet above this coal in the hole, there is a showing of about twenty inches in thickness of coal smut. In an other hole in this branch, some fifty yards farther up the branch, there is more coal, under water, which was felt down to a thickness of eighteen inches. It is probably of the same coal as the smut on the hill side. These out-crops are of the *upper* and *lower groups* of (30) of the *General Section.* In a settlement road in the N. E. ¼ of N. E. ¼ of S. 19, T. 17, R. 5 W., there are several out-crops of this same seam, as follows:

Out-cropping in Settlement Road, in the N. E. ¼ of N. E. ¼ of S. 19, T. 17, R. 5 W.

(9)	COAL SMUT; *upper group*		1 ft. 10 in.
(8)	*Shale*; argillaceous		7 ft. 0 in.
(7)	COAL SMUT; slatey near the top	*Lower Group.*	1 ft. 0 in.
(6)	*Slate;* clayey		2 ft. 6 in.
(5)	COAL SMUT		11 in.
(4)	*Clay Slate*		9 in.
(3)	COAL SMUT		1 ft. 6 in.
(2)	*Fire Clay*		2 ft. 0 in.
(1)	*Sandstone*		

These sections of imperfect and partly exposed out-crops will have to be taken with a full grain of allowance, for they, at best, in many instances, but poorly represent the true seams of coal for which they stand. In the public road near Mr. Jimmy Vine's, in the N. E. ¼ of N. W. ¼ of S. 19, T. 17, R. 5 W., there is an out-cropping of about twelve inches of coal smut with a thin streak of clay or clayey slate near the center, which is seemingly some forty feet lower than the above out-croppings of the thick seam in the above settlement road. It is likely of (29) of the *General Section.* In this same public road near the top of the hill, about three-fourths of a mile south of the crossing of Wolf Creek, there is an out-cropping of coal with slate partings, which is of the same thick seam as those in the above settlement road, or (30) of the *General Section.* From forty to forty-five feet below this out-cropping and on the opposite side of Wolf Creek, there is a showing of coal smut from four to six inches thick, which may be of the same seam as the one that shows in the road near Mr. Jimmy Vine's. Still farther to the south, on the side of the public road in the southern part of S. 20, T. 17, R. 5 W., there is the following out-crop of coal, which is likely of (29) of the *General Section,* or of this same seam:

Out-Crop in Southern part of S. 20, T. 17, R. 5 W.

(5)	*Shale;* showing	20 ft. 0 in.
(4)	COAL	6 in.
(3)	*Slate;* clayey	1½ in.
(2)	COAL	5 in.
(3)	*Fire Clay*	3 to 0 in.

This coal also crops out about 200 yards farther down the road or to the south, and about one-half mile still farther down the road to the south, and ten to twelve feet lower, there is a very imperfect out-cropping of a part of a higher seam, (30) of the *General Section,* in the road near the foot of *Patrick's hill,* as follows:

Out-Crop near the foot of Patrick's Hill in the S. E. ¼ of S. 35, T. 17, R. 6 W.

(6)	*Sandstone*; very massive and coarse.	
(5)	*Debris;* about	5 ft. 0 in.
(4)	COAL SMUT; visible	2 in.
(3)	*Clay* or *Clayey Slate*	2 in.
(2)	COAL SMUT; about	1 ft. 2 in.
(1)	*Fire Clay.*	

This out-crop is nearly 200 feet below the level of "Patrick's hill," which is composed principally of a heavy bed of shale. It is believed to be (28) of the *General Section.*

In a deep hollow or ravine, in the S. E. ¼ of S. 35, T. 17, R. 6 W. there is an out-cropping of coal which has been considerably surface worked by the neighborhood blacksmiths. This coal, as it appeared on the root of a blown up tree, seemed to be over two feet in thickness and to have no partings; it is of (28) of the *General Section.* In an other hollow or ravine, in the N. W. ¼ of S. 2, T. 18, R. 6 W., there is an out-cropping with from eight to ten inches of coal visible, which is doubtless of this same seam, and in an other ravine, near the center of S. 34, T. 17, R. 6 W., there is an out-cropping of a good hard seam of coal about fifteen inches thick, without any partings, which is likely of the lower group of the same seam, (30) of the *General Section.* The strata hereabouts appears to be in waves though they are believed to have a general dip to the south-west. From the debris about four feet above this last coal, there issues a bold spring of chalybeate water, which likely comes from the *upper group* of this seam. Near Mr. L. Vine's, on the head waters of Glazy or Fed Creek, in the N. W. ¼ of S. 23, T. 17, R. 6 W., there crops out from under a bluff of hard curly massive shale, a seam of coal which has been considerably surface worked, but which at the time visited, was completely hid by fallen debris. It is believed to be of (33) of the *General Section.* About one-fourth of a mile from the mouth of this creek, or in the S. E. ¼ of S. 15, T. 17, R. 6 W., there is an out-cropping about eighteen inches thick of good coal without any partings and with an underbed of fire clay, which is full of stem and leaf impressions. This coal is believed to be of the *upper group* of (30) of the *General Section.* Up the creek or SES. from this out-crop about 200 yards and some fifteen feet over it, there is an other out-cropping of coal from under a bluff of massive sandstones. It is most likely (31) of the *General Section.* The strata between these two out-crops dip about 3° to the south-west. In the river just above the mouth of this creek or *Glazy Shoals,* and some eight to ten feet lower than the above eighteen inch seam of coal, there is said to be an out-cropping from which boat loads of coal have been raised. These two coals are doubtless of the upper and lower groups of the same seam, (30) of the *General Section.* Coal also crops out in the river about one and a half miles higher up stream, or about one-half mile below the mouth of Coal Creek, and on a branch, in the S. W. ¼ of S. E. ¼ of S. 3, T. 17, R. 6 W., not far from the mouth of Coal Creek. The bed of Coal Creek, in the N. E. ¼ of N. E. ¼ of S. 10, T. 17, R. 6 W., for 150 yards, is one sheet of coal which shows to a thickness of about two feet, including a seven inch parting of slate. This is of the *lower group* of (28) of the *General Section.* The following section is given in Tuomy's First Biennial Report, on page 85:

Section on Coal Creek.
(From Tuomy's First Biennial Report, page 85.)

(5)	COAL	1ft. 1 in.
(4)	*Shale*	1 in.
(3)	COAL	5 in.
(2)	*Shale*	1 in.
(1)	COAL	1 ft. 10 in.

This section is doubtless of the *upper group* of (28) of the *General Section.* Higher up Coal Creek, or in the S. W. ¼ of S. 2, T. 17, R. 6 W., the bed of the creek for some 200 yards is formed of coal, of which the following is about a section:

Out-Crop on Coal Creek in the S. W. ¼ of S. 2, T. 17, R. 6 W.

(12)	*Sandstone, Slate*; showing about	12 ft. 0 in.
(11)	*Debris*	4 ft. 0 in.
(10)	Coal	1 ft. 8 in.
(9)	*Clay;* parting	½ in.
(8)	Coal	1½ in.
(7)	*Slate*; hard and black	½ in.
(6)	Coal; bony on top	11 in.
(5)	*Slate*	½ in.
(4)	Coal	1 ft. 0 in.
(3)	*Slate;* soft and bluish	1½ in.
(2)	Coal; cubical	1 in.
(1)	*Fire Clay;* fossiliferous.	

This out-cropping is of the *upper group* of (28) of the *General Section.* The strata along the creek between these two out-crops are in long flat waves from north-east to south-west, though the general dip is some 3° to 4° to the south-west. These waves appear to be about fifty feet long, from top of crest to top of crest, and about two feet deep from top of crest to bottom of trough. Some two miles higher up Coal Creek, in the N. W. ¼ of S. 35, T. 16, R. 6 W., there is said to be an other out-cropping of coal, and on the west prong of this creek, in the S. W. ¼ of S. W. ¼ of S. 26, T. 16, R. 6 W., there is the following out-crop of (30) of the *General Section:*

Out-Crop in the S. W. ¼ of S. W ¼ of S. 26, T. 16, R. 6 W.

(7)	*Shale;* hard and sandy, visible about	5 ft. 0 in.
(6)	Coal	8½ in.
(5)	*Slate;* irregular	¼ in.
(4)	Coal	5 in.
(3)	*Slate;* only in places	¼ in.
(2)	Coal	2 ft. 0 in
(1)	*Fire Clay;* underbed.	

The following section is given, at the top of page 41, in the Report of Progress of the Geological Survey for 1879 and 1880, and is more than likely of the same coal, and perhaps of the same out-cropping, as that of the last section:

Coal Out-Cropping in S. 26, T. 16, R. 5 W.

Sandstone roof.	
COAL	1 ft. 0 in.
Clay parting	¾ in.
COAL	2 ft. 6 in.
Sandstone bottom.	

On the same page of the same report the accompanying analysis of an average sample of this coal is to be found:

Specific gravity	1.351
Sulphur	1.525
Moisture	1.850
Volatile Matter	27.561
Fixed Carbon	61.696
Ash	8.893
	100.000

Still higher up Coal Creek, near its head waters, there is said to be an other out-cropping of coal, which is probably of the same seam as the out-crop of the last two sections, though it may be of a higher seam, (31) of the *General Section*. In the road, some 100 feet above the out-crop of this last section, near the top of the divide between Coal and Skelton creeks, there is to be seen about sixteen inches of coal smut, with an underbed of fire clay and a cover of shale. It is probably of (32) of the *General Section*. The above coal out-crops along the bed of Coal Creek are, therefore, of the two seams (28) and (30) of the *General Section*.

Though there is such a fine display of coal along Coal Creek, there is, strange to say, no coal known of on Prescott Creek, which, in a general way, is parallel to Coal Creek, and is only about one and a half miles west of it. The strata along Prescott Creek are principally of the thick bed of shale between (30) and (32) of the *General Section*, which appear to have a dip to the north-west.

There crops out, nearly 100 feet above low water, from under the high capping bluff on the east side of the river at Fork Shoals, about half-way between the fork of the river and Taylor's Ferry, the following section of (32) of the *General Section :*

Section at Fork Shoals.

(4)	*Sandstone*; massive and bluffy, showing about	25 ft. 0 in.
(3)	COAL	4 in.
(2)	*Slate*	2 in.
(1)	COAL; visible 1 foot 5 inches, said to be	1 ft. 6 in.

A section, similar to the above, is given of this out-cropping of coal by the State Geologist in his report for 1879 and 1880. He also gives in that report an analysis of an average sample of the coal of this out-cropping, as follows:

Specific gravity	1.325
Sulphur	.793
Moisture	4.976
Volatile Matter	27.169
Fixed Carbon	62.135
Ash	5.720
	100.000

This is the uppermost seam of coal of Walker county.

About one mile down the river, south from the Fork Shoals, there is said to have been struck a seam of coal in Mr. Short's well, on a high point about 100 yards east of the river, and along a branch in the S. W. ¼ of S. 20, T. 17, R. 6 W., a seam of coal is reported to be within a few feet of the surface, as it has been dug down to in several places. This latter seam of coal is likely (31) of the *General Section*, while the former is probably the same as the one under the bluff at Fork Shoals, which also crops out about three-quarters of a mile farther to the S E S., or near the head-waters of the above branch, which has but little fall, in what is known as the *Gilmore coal bed.*

In the *rock house*, under the crescent shape bluff around the head of *Coal Cave Hollow*, in the N. W. ¼ of N. E. ¼ of S. 30, T. 17, R. 6 W., there is an out-cropping of a good, hard seam of coal, with an underbed of hard fire clay and a cover of hard shale. This coal out-crop is the *upper group* of (30) of the *General Section.* It is about twenty inches thick. In the Geological Report for 1879 and 1880, there is given the following section, which is of this same seam, though seemingly quite different:

Section in Coal Cave Hollow.
(From Geological Report for 1879 and 1880.)

COAL; good, cubical blocks	4 in.
Dark Clay Slate	6 in.
COAL; good, containing near the top ¼ inch of pyrites	10 in.
Slate parting, with flakes of pyrites	¼ in.
COAL, good, rather soft	4 in.
Mother of Coal, parting	¼ in.
COAL, good, bottom not seen, reported	2 ft. 0 in.

The following analysis is of an average sample of the coal from the above out-cropping:

Specific gravity4	1.330
Sulphur	1.945
Moisture	1.258
Volatile Matter	26.253
Fixed Carbon	59.896
Ash	12.594
	100.000

About three-quarters of a mile south-east of the above out-crop at the head of *Coal Cave Hollow*, and, it is believed, from fifteen to twenty feet lower, there is said to be in the bed of a branch an other showing of coal which is probably of the same seam as that of the last section or (30) of the *General Section.* In Jack Esper's well, in the S. E. ¼ of S. 25, T. 17, R. 7 W., there is said to be coal which must be some seventy-five to eighty feet higher than that at the head of *Coal Cave Hollow* or is probably (32) of the *General Section.*

In Valley Creek, both below and above the mouth of *Panther Branch*, or in the N. E. ¼ of S. E. ¼ of S. 4, T. 18, R. 6 W., there are out-crops of coal which are doubtless of the same seam, (30) of the *General Section*, though there are shoals of flaggy and slabby sandstones between them. The strata must therefore be in waves or perhaps these shoals are of strata between the upper and lower groups. The upper group of this same coal crops out also in Panther Branch, in the N. W. ¼ of S. W. ¼ of S. 4, T. 18, R. 6 W., where it is from eighteen to twenty inches thick and has a thin parting of slate. The out-crops of coal in Valley Creek just below Jacob Smith's Mill, in the N. E. ¼ of N. E. ¼ of S. 9, and just below Laird's Mill, in the N. E. ¼ of N. E. ¼ of S. 10, T. 18, R. 6 W., are also believed to be of this same seam, (30) of the *General Section.* There is said to be only eighteen inches fall in Valley Creek between the coal out-crops in Valley Creek just above the mouth of Panther Branch and the one just below Smith's Mill, and that the back water from Smith's Mill dam, which is about seven feet high, covers the coal out-crop just below Laird's Mill. Some fifty-five feet above the coal in Valley Creek, there is visible in the road near Smith's Mill about ten inches of coal smut, which may be in a slide, and some forty-five to fifty feet still higher, there is in the gully in front of Mr. Jacob Smith's house, in the S. W. ¼ of S. W. ¼ of S. 3, T. 18, R. 6 W., the following out-crop :

Out-Crop in S. W. ¼ of S. W. ¼ of S. 3, T. 18, R. 6 W.

(7)	*Shale;* visible about	20 ft. 0 in.
(6)	COAL	11 in.
(5)	*Clay* or *Clayey Slate*	1½ in.
(4)	COAL	3½ in.
(3)	*Slate;* clayey	½ in.
(2)	COAL SMUT	2 in.
(1)	*Fire Clay;* underbed.	

These last two coal out-crops are likely of the seams (31) and (33) of the *General Section.* On a branch in the S. W. ¼ of N. E. ¼ of S. 19, T. 18, R. 6 W., there is said to be more coal which has been surface worked some. It is likely (32) of the *General Section.* In a field east of *Toadvine,* or in the north-east corner of S. 10, T. 18, R. 6 W.. a seam of coal is said to have been struck in digging stack-holes and in the road, in the S. E. ¼ of N. E. ¼ of S. 10, T. 18, R. 6 W., there is a thin showing of coal smut. These out-crops are likely of (31) and (32) of the *General Section.* In two springs at *Rock Creek Church,* and in the road near the springs, all in the S. E. ¼ of S. 12, T. 18, R. 6 W. and some fifty feet above the coal in the stack-holes, though doubtless of the same seam, there are out-croppings of a seam of coal which showed almost eighteen inches of its thickness and is said to be two feet or more thick. Some sixty feet higher than these springs, there is in the old Oaky Hollow road, near Mr. Reeves', in the N. E. ¼ of S. 12, T. 18, R. 6 W., an out-cropping about ten inches thick of coal smut, including a parting of slate two inches thick. This out-cropping is of (33) of the *General Section.* Mr. Reeve's spring is chalybeate water which doubtless comes from (32) of the *General Section.* Near the mouth of a branch which empties into Rock Creek in the S. E. ¼ of N. W. ¼ of S. 7, T. 18, R. 6 W., there is an out-cropping of from fifteen to sixteen inches thick of good hard coal, which is of a seam that is considerably below the one that crops out in the spring and road near Rock Creek Church, or is of the *upper group* of (30) of the *General Section.* Some twenty-five feet above this coal out-crop, there is in the road, just east of the bridge over Rock Creek, a thin showing of coal smut, which is of (31) of the *General Section,* and some 125 feet still higher, near the top of the high broad ridge or plateau, there are some very massive and coarse grain sandstones. On a branch in the extreme south-west corner of S. 5, T. 16, R. 5 W. and on an other branch at the foot of *Patrick's Hill,* in the S. W. ¼ of N. E. ¼ of S. 36, T. 17, R. 6 W., there are out-croppings of a seam from seventeen to eighteen inches thick of good coal, with an underbed of hard fire clay, which is full of stem and leaf impressions. This coal is of the *upper group* of (30) of the *General Section* or is of the same seam as the out-crop under the crescent head of Coal Cave Hollow and near the mouth of the branch below the bridge over Rock Creek. The coal from the out-crop near the foot of Patrick's Hill has been considerably worked by the black-smiths for ten miles around, with whom it has an excellent reputation. Up Rock Creek some three to four miles above the bridge or at Tilman Salter's old mill site, there occurs the following approximate section:

Approximate Section at Tilman Salter's Old Mill Site on Rock Creek, in the N. E. ¼ of S. 9, T. 18, R. 5 W.

(8) *Conglomerate;* between (35) and (36) of the *General Section.*
(7) *Debris, Shale, Sandstone*; about .... 120 ft. 0 in.
(6) COAL SMUT; (31) of the *General Section*, visible .....8 in.
(5) *Fire Clay;* visible ....6 in.
(4) *Debris;* about.......... .. .. 40 ft. 0 in.
(3) COAL; (30) of the *General Section* .. .. 1 ft. 0 in.
(2) *Slate*.............. .... 3 in.
(1) COAL; under water, said to have been down into, without getting through it, ...2 ft. 0 in.

Some two and a half miles farther up Rock Creek, or in the S. E. ¼ of S. 11, T. 18, R. 5 W., there is in the edge of the water and about 140 feet under the above conglomerate, an out-cropping of coal about twenty inches thick, which we believe is of the same seam as (1) of the last section or is (30) of the *General Section.* The strata near these outcrops dip to the north-west.

In the N. W. ¼ of N. E. ¼ of S. 24, T. 18, R. 5 W., there is a ridge which is known as *Clarke Mountain.* It runs WNW. and ESE. and is about one-half mile long and 175 feet high. It seems to be made up of shale with the exception of the conglomerate around its base and a massive boulder sandstone near its top. The *Pratt seam*, it is believed, could be found on the side of this mountain, about 115–120 feet from its top. In a well at the foot of the northwest end of this mountain, there is said to be a six inch seam of coal which can not be very far under the above conglomerate. This conglomerate crops out along the public road near Ernest P. O. and in a good many other places on the divide between Rock and Lick creeks.

Going back to Valley Creek, there are to be seen for a mile or so along the creek in S's 23 and 24, T. 18, R. 6 W. and near the level of the back water from the dam at Waldrop's old mill, numerous out-crops, at short intervals, of alternate strata of coal and slate, which belong to (30) of the

General Section. The best exposed of these out-crops, which is in the N. E. ¼ of N. E. ¼ of S. 23, T. 18, R. 6 W., shows about as follows:

Out-Crop in the N. E. ¼ of N. E. ¼ of S. 23, *T.* 18, *R.* 6 *W.*

(13)	*Sandstone*; bluff, cover to rock house.	
(12)	*Shale*; hard and sandy, curly with kidney shape concretions, about	10 ft. 0 in.
(11)	*Slate*, COAL	1 in.
(10)	COAL	1½ in.
(9)	*Slate*	2½ in.
(8)	COAL	4 in.
(7)	*Sandstone, Slate*	4 in.
(6)	COAL	½ in.
(5)	*Slate*	¼ in.
(4)	COAL	4½ in.
(3)	*Fire Clay*; hard	3½ in.
(2)	COAL	1 ft. 1 in.
(1)	*Slate, Debris*; to level of water	3 ft. 0 in.

An other one of these coal out-crops, which is in the N. W. ¼ of N. W. ¼ of S. 24, T. 18, R. 6 W., shows about as follows:

Out-Crop in N. W. ¼ of N. W. ¼ of S. 24, *T.* 18, *R.* 6 *W.*

(7)	*Shale;* hard, bluff.	
(6)	COAL; with streaks of slate near the center	2 in.
(7)	*Slate*	1½ in.
(6)	COAL	2 in.
(5)	*Slate*; hard	6 in.
(4)	COAL	6 in.
(3)	*Slate*	6 in.
(2)	*Slate*, COAL; in alternate layers, extending down into water	1 ft. 0 in.
(1)	COAL; felt six inches and six feet under water, with doubtless a parting several feet thick.	

Between these two out-crops and for one-half mile down the creek from the first one, coal can be seen in many places in the banks near the water's edge. The dip of these out-crops is very slight, though it is seemingly a little to the south-west.

In the Oakey Hollow road, in the N. W. ¼ of S. W. ¼ of S. 13, T. 18, R. 6 W., there is an out-crop of coal smut about twelve inches thick, which is of (31) of the *General Section.* This out-crop dips seemingly to the north-west. In Mr. Reeves' field, in the N. W. ¼ of N. W. ¼ of S. 24, T. 18, R. 6 W., there is an out-cropping which shows only six to eight inches of coal, with slate parting, but which is believed to be of the above seam, that crops out along Valley Creek, or (30) of the *General Section.* At a spring on the opposite or south side of Valley Creek, in the south-east corner of S. 15, T. 18, R. 6 W., there is a *coal bed* in the out-cropping of a seam of coal which is said to be two feet in thickness. It is thought to be of (32) of the *General Section.* Along Valley Creek, just below Waldrop's Old Mill, now J. K. P. Laird's Mill, at the crossing of the Oaky Hollow road, in the N. W. ¼ of N. E. ¼ S. 23, T. 18, R. 6 W., there is a high bluff of the massive sandstones, between (30) and (31) of the *General Section*, which have a dip of 3° to 4° to the south-east. In the road just south of the creek and the above mill, and some twenty feet above the creek, there is an out-cropping of coal smut which is likely (31) of the *General Section*; and farther down the road, in the road, and also on the opposite side of a short ridge, or in the N. W. ¼ of N. W. ¼ of S. 26, T. 18, R. 6 W., there are out-crops of the nexf higher seam, (33) of the *General Section.* At this last out-cropping the coal seam has a some-what similar section to the Pratt Coal Seam. It has about the following section:

Out-Crop in N. W. ¼ of N. W. ¼ of S. 26, T. 18, R. 6 W.

(5) *Debris.*
(4) COAL..3 ft. 8 in.
(3) *Slate;* clayey....................................½ in.
(2) COAL......................................4 to 6 in.
(1) *Fire Clay;* hard

On the side of the hill some fifteen feet below this out-cropping, there are loose boulders of massive sandstones, which may in places be conglomerates. Just above the County's iron bridge over Valley Creek, in the N. E. ¼ of N.

W. ¼ of S. 25, T. 18, R. 6 W., there is a shoal of hard massive shales, which are cut up by perpendicular parallel planes of division, from ten to twelve feet apart, running across the creek in a north-west and south-east direction. Some eighty-five to ninety feet above Valley Creek, on *John's Branch* in the N. W. ¼ of S. W. ¼ of S. 31, T. 18, R. 5 W., there is the following out-crop of coal, which here also resembles the *Pratt Seam* in its section, though it is doubtless (33) of the *General Section*:

Out-Crop on John's Branch, in the N. W. ¼ of S. W. of ¼ S. 31, *T.* 18, *R.* 5 *W.*

(8)	*Shale;* with kidney shape concretions.	
(7)	COAL	6½ in.
(6)	*Slate*	¼ in.
(5)	COAL; visible 1 foot 8 inches, reported	4 ft. 0 in.
(4)	*Debris. Fire Clay*	5 ft. 0 in.
(3)	COAL	6 in.
(2)	*Fire Clay*	1 ft. 0 in.
(1)	*Sandstone*; massive.	

Some thirty feet under this out-crop, there is on Lick Branch a showing of about one and one-half inches of coal in shale. There is a reported out-cropping of coal in the S. W. ¼ of S. 17, T. 18, R. 5 W., and at Mr. Joe Caldwell's spring, in the N. E. ¼ of S. W. of ¼ S. 34, T. 18, R. 5 W., there is a showing of about four inches of coal smut some twelve to fifteen feet under conglomerates, or massive sandstones with ferruginous pebbles. This coal is believed to be of (35) of the *General Section*. Scattered over the surface near these conglomerates, there are some small rounded flint pebbles, which doubtless came from the weathering of these conglomerates. In the public road just north-east of Mr. Tom Bridges', or in the N. E ¼ of N. W. ¼ of S. 2, T. 19, R. 5 W., there is a thin out-cropping of coal smut, and on Black Branch, in the S. E. ¼ of S. E. ¼ of S. 3, T. 19, R. 5 W., there is a coal out-cropping about ten inches thick, under hard shale which is full of rounded concretions of *clay iron stone*. There is said to be in Black Branch, some thirty to thirty-five feet under this last coal, an out-cropping of an other seam of coal, which must be two feet or more in thickness. These two coal out-crops on Black Branch have a high angle of dip of about 50° to the south-east or are near the line of fault which separates the *big and little basins.* Along a line some fifty to sixty yards north-west of these coal out-crops, the strata are nearly perpendicular, or the dip suddenly changes from 75° to 80° to the south-east to that of 75° to 80° to the north-west. The line of this sudden change of dip, which probably corresponds to that of the above fault, runs here about S. 50° W. or N. 50° E. If this fault be taken as the line of separation between the *little* and *big basins,* the above out-crops of coal, on Black Branch, are in the *little basin.* Lower down the branch and on the opposite side of the fault, or in the S. W. ¼ of S. W. ¼ of S. 3, T. 19, R. 5 W., there is an out-cropping of coal which has a dip of 12° to 15° to the north-west, and still lower down the branch or to the north-west, about one-fourth of a mile, there is reported to be more coal. In a ravine and small branch, in the S. E. ¼ of S. E. ¼ of S. 3, T. 19, R. 5 W., there is to be seen an out-cropping of about twelve inches in thickness of coal with slate partings. It seems to have a dip of about 85° to the north-west and may be of one of the first two seams of coal mentioned on Black Branch. Lower down, or farther to the south-west, along the line of fault and anticlinal fold, which separates the *little* and *big basins,* there are a great many out-crops of coal, but we will leave them for consideration in connection with the *little basin.*

Under the capping bluff and some sixty feet from the top of the high divide between Valley Creek and the head waters of Mud Creek, there crops out a thick seam of coal which is (37) of the *General Section,* and is believed to be the Pratt Seam.

The following is a section of its out-crop at the *Bryant's Coal Bed,* in the N. E. ¼ of N. E. ¼ of S. 12, T. 19, R. 6 W.

Out-Crop at Bryant's Coal Bed, in the N. E. ¼ of N. E. ¼ of S. 12, T. 19, R. 6 W.

(6)	*Shale, Debris;* cover.	
(5)	COAL	½ in.
(4)	*Slate*; variable	1 in.
(3)	COAL; with streak of slate near the centre	4 in.
(2)	*Fire Clay.*	7 in.
(1)	COAL; the top twelve inches slaty, visible	4 ft. 7 in.

This seam at an out-cropping, which is known as the *Rainey (Big Jim) Coal Bed*, in the N. W. ¼ of S. W. ¼ of the same *section*, shows as follows:

Out-Crop at the Rainey Coal Bed, in the N. W. ¼ of S. W. ¼ of S. 12, T. 19, R. 6 W.

(12)	*Debris;* cover.	
(11)	COAL; *Shaly*	6 in.
(10)	*Slate;* clayey, variable	10 in.
(9)	COAL	4 in.
(8)	*Slate*	2 in.
(7)	COAL	1 ft. 1 in.
(6)	*Slate;* clayey	1 in.
(5)	COAL; visible	1 ft. 0 in.
(4)	*Debris*	3 ft. 6 in.
(3)	*Fire Clay*	8 in.
(2)	COAL; visible	5 in.
(1)	*Debris.*	

This seam of coal crops out in a great many places near the heads of the ravines, which extend up into this divide, and in these out-crops has a dip of 4° to 5° to the north-west.

Near Mr. T. Melvin Parsons', in the south-west corner of the N. W. ¼ of S. 24, T. 19, R. 6 W., there is an out-cropping of coal which is reported to be two feet thick, and which is likely (32) of the *General Section.* This same coal, it is thought, crops out some twenty-five feet lower, on Dry Branch, in the S. W. ¼ of S. E. ¼ of S. 23, T. 19, R. 6 W., where, on the out-crop, it is from two feet six inches to three feet thick, and has a dip of 4° to 5° to the north-west. This seam, (32) of the *General Section*, is the same seam as shows for 75 to 100 yards under a bluff on Mud Creek, near the widow Hogg's, or in the S. E. ¼ of S. W. ¼ of S. 15, T. 19, R. 6 W., about thirty inches thick, with two thin streaks of slate. Up the creek, or south of this last out-cropping near the widow Hogg's, about 150 yards, there is said to be, in the bed of the creek, an other out-cropping of coal, which is four feet thick; it is likely (30) of the *General Section.*

On *Gin Branch*, in the N. W. ¼ of S. E. ¼ of S. 15, T. 19, R. 6 W., and in the road, in the S. E. ¼ of S. W. ¼ of S. 11, T. 19, R. 6 W., there are other out-crops of coal; the latter one shows about as follows:

Out-Crop in Road,
in the S. E. ¼ of S. W. ¼ of S. 11, *T.* 19, *R.* 6 *W.*

(4)	*Shale.*	
(3)	COAL SMUT; about	4 ft. 0 in.
(2)	*Clayey Slate;* about	8 in.
(1)	COAL SMUT	3 in.

This out-crop is nearly 200 feet below the *Rainey bed*; it is doubtless (33) of the *General Section.*

Coal is said to occur in Mud Creek, just above and below Travis' ford, or the crossing of the old Oaky Hollow road, in the S. E. ¼ of S. E. ¼ of S. 9, T. 19, R. 6 W. It is believed to be of (32) of the *General Section*, though it may be (31) of the *General Section.* In the above Oaky Hollow road, on the south side of the creek and some 220 to 225 feet above the coal in the creek, there is an out-cropping of coal smut in the road, and still higher, about 300 feet above the creek at Travis' ford, and just under the capping sandstone, there is more coal at a spring in the N. E. ¼ of N. W. ¼ of S. 16, T. 19, R. 6 W. This last coal is believed to be the *Pratt Seam*, or of the same seam as the Bryant and Rainey beds, or (37) of the *General Section.* Some 235 feet below this spring, there is, on a tributary of Wood's Creek (which is known as *Mealy Branch*), in the S. W. ¼ of N. E. ¼ of S. 17, T. 19, R. 6 W., an out-cropping of coal which is said to have been dug into about two feet without getting through it. It is (33) of the *General Section.* This same seam of coal also crops out in the ditches of an old field, in the S. W. ¼ of S. E. ¼ of S. 9, T. 19, R. 6 W., where it appears to have about the following section:

Coal Out-Cropping,
in the S. W. ¼ of S. E. ¼ of S. 9, T. 19, R. 6 W.

(5)	*Shale.*	
(4)	COAL SMUT; about	3 ft. 1 in.
(3)	*Slate*	8 in.
(2)	COAL SMUT; about	1 ft. 0 in.
(1)	*Fire Clay.*	

This same seam also crops out on the side of a hill about one-fourth of a mile NWN. from the out-crop of the above section. Some forty-five feet below these coal out-crops, the seam (32) of the *General Section*, crops out in Mr. Roger's well, between the last two out-crops. There is coal also in Mud Creek in front of Mr. Rogers' house, which must be of the same seam as the coal in Mud Creek just above and below Travis' ford and that in Mr. Rogers' well. Mr. Rogers' house appears to be near the lowest portion of the great synclinal trough of the Warrior coal field. In Mr. W. C. Howton's well, about one-half mile farther to the north, or in the S. E. ¼ of S. E. ¼ of S. 12, T. 19, R. 7 W., there is a thick seam of coal, which is doubtless (33) of the *General Section*, that seemingly has risen about thirty feet in one-half mile to the north-west. There are said to be several other coal out-crops here-abouts, which are of this this same seam. There occurs under this seam of coal, a very coarse grain massive sandstone, as seen along the road between Mr. W. C. Howton's and the creek and in the public road near Mr. S. V. Travis, in the N. E. ¼ of S. W. ¼ of S. 10, T. 19, R. 6 W. Mr. Travis' spring doubtles rises in this seam of coal, which also crops out in Mr. C. L. Rogers' horse lot, in the N. W. ¼ of N. W. ¼ of S. 10, T. 19, R. 6 W., some one-half mile north-west of Mr. Travis' spring and on ground about twenty feet higher. It also crops out in a ditch in front of Mr. Cargle's house, in the N. W. ¼ of S. E. ¼ of S. 3, T. 19, R. 6 W. On a branch in the S. W. ¼ of S.

S. E. ¼ of S. 3, T. 19, R. 6 W., near Mr. Young Parson's, there is an out-cropping of coal which is believed to be of (32) of the *General Section* or of the same seam as the coal in Mud Creek near Mr. Rogers' and Travis' ford. Still higher up the Oaky Hollow road or to the north-east from Mr. Cargle's, there is on the side of the road near "*Little Jim Rainey's*," in the S. W. ¼ of S. W. ¼ of S. 35, T. 18, R. 6 W., an other out-cropping of (33) of the *General Section*, with coarse grain, massive sandstone about ten feet under it. The dip is to the south-east. This same coal seam also makes its appearance near the top of a hill in the S. E. ¼ of S. W. ¼ of S. 27, T. 18, R. 7 W., where it is said to be about three feet six inches thick, and all around "*Coal Mountain*," in the N. W. ¼ of S. 34, T. 18, R. 6 W., where the out-crop again appears to be about three feet six inches thick. *Coal Mountain* is an isolated ridge, which is narrow from east to west but is about one mile long from north to south. Some 140 to 150 feet below this coal out-crop around Coal Mountain, there is, at the Howton's old mill site on Mud Creek, in the N. E. ¼ of N. W. ¼ of S. 33, T. 18, R. 6 W., the following out-cropping:

Out-Cropping at Howton's Old Mill on Mud Creek, in the N. E. ¼ of N. W. ¼ of S. 33, T. 18, R. 6 W.

(7)	*Sandstone;* visible about	12 ft. 0 in.
(6)	COAL	3 in.
(5)	*Slate*	11 in.
(4)	COAL	8 in.
(3)	*Slate*	3 in.
(2)	COAL	8 in.
(1)	*Fire Clay*; to edge of water	8 in.

The dip of this out-crop is 8° to 10° to the south-east. About tweny-five feet above this coal out-cropping, there is believed to be under a bluff on the south side of the creek, just above the old mill site, an out-cropping of an other seam of coal, which, at the time visited, was covered by debris. About one-half mile below the above old mill, the bed of Mud Creek is said to be an out-cropping of coal, from which lumps of coal several feet in diameter can be raised, so it is said, and which is believed to be of the *lower group* of the coal out-cropping at the old mill. These out-crops along Mud Creek, near the above old mill, are of (30) and (31) of the *General Section.*

In both of Mr. John Howton's springs, in the S. W. ¼ of N. E. ¼ of S. 21, T. 18, R. 6 W., there can be seen about the following out-crop:

Out-Crops in Mr. John Howton's Springs,
in the S. W. ¼ of N. E. ¼ of S. 21, T. 18, R. 6 W.

(7)	*Sandstone;* bluffy.	
(6)	Coal; slaty	2 in.
(5)	*Slate*	8 in.
(4)	Coal	2 in.
(3)	*Slate*	8 in.
(2)	Coal	1 ft. 3 in.
(1)	*Fire Clay.*	

These out-crops have a dip to the south-east and are over one-hundred feet above the coal in Mud Creek at Howton's old mill site or are of (32) of the *General Section.* In an other spring, about one-quarter of a mile north-east of Mr. John Howton's, there is an other coal out-cropping which is doubtless of the same seam. The spring at *Oak Grove Church,* in the S. E. ¼ of S. E. ¼ of S. 22, T. 18, R. 6 W., is of very strong chalybeate water and more than likely comes from this same seam of coal, (32) of the *General Section.* In Mud Creek in the N. W. ¼ of S. W. ¼ of S. 8, T. 18, R. 6 W., and in Cedar Branch in the N. W. ¼ of N. W. ¼ of S. 18, T. 18, R. 6 W., there are to be seen coal out-crops. The out-crop on Cedar Branch shows for several hundred yards along the branch and is said to have the following section,

Out-Crop on Cedar Branch,
in the N. W. ¼ of N. W. ¼ of S. 18, T. 18, R. 6 W.

(4)	*Sandstone.*	
(3)	Coal	9 in.
(2)	*Slate*	1 ft. 0 in.
(1)	Coal; reported	2 ft. 0 in.

This same seam of coal, which is (32) of the *General Section*, crops out also in the public road in the S. E. ¼ of N. W. ¼ of S, 7, T. 18, R. 7 W. In this same road at *Big Creek Church*, in the S. W. ¼ of N. W. ¼ of S. 7, T. 18, R. 7 W. and S. E. ¼ of N. E. ¼ of S. 12, T. 18, R. 8 W., there shows, from ten to twelve inches in thickness, coal smut which is believed to be of a seam twenty-five to thirty feet lower than the coal out-crop just mentioned, or of (31) of the *General Section.* Near the Weaver Mill, on Valley Creek, or in the S. E. ¼ of S. 36, T. 17, R. 7 W., there are the *Frierson old coal mines*, which consist of extensive old surface *diggings* into the out-crop of (30) of the *General Section*, that is reported to have the following section:

Section of Coal Seam at Frierson's Old Coal Mines, in the S. E. ¼ of S. 36, T. 17, R. 7 W,

(4)	*Shale*; cover.	
(3)	COAL	6 in.
(2)	*Slale*	2 ft 6 in.
(1)	COAL	2 ft. 0 in.

The coal that was raised at these mines was loaded in boats and floated, during freshets or high stages of the water, down the river to Tuscaloosa and Mobile. This same seam of coal also crops out in the N. W. ¼ of N. E. ¼ of S. 35, T. 17, R. 7 W, near the mouth of a branch which empties into the river just below *Heard Shoals*, and on Hurricane Branch, about 150 yards from its mouth, or in the N. W. ¼ of N. W. ¼ of S. 2, T. 18, R. 7 W. These out-crops appear as follows:

Out-Crops in the N. W. ¼ of N. E. ¼ of S. 35, T. 17, R. 7 W. and in the N. W. ¼ of N. W. ¼ of S. 2, T. 18, R. 7 W.

		(1)	(2)
(4)	*Shale*; cover.		
(3)	COAL; variable	4 in.	5 in.
(2)	*Clay Slate*; variable	1 ft. 2 in.	2 ft. 3 in.
(1)	COAL; visible 1 ft., reported	2 ft. 0 in.	Visible 2 ft. 0 in.

No. 1 is of the out-crop on the branch near the foot of Heard Shoals and is about twenty-five feet above low water in the river just below Knight's Mill dam or the shoals, and about five feet lower than the coal out-crop of the same seam at *Frierson's old mines*. *No.* 2 is of the out-crop on Hurricane Branch, which is only two to three feet above low water in the river and hence is between twenty-five and thirty feet lower than the coal out-crop of Frierson's old mines. From this out-crop on Hurricane Branch, boat loads of coal have been raised from pits along the branch and floated down the river. These out-crops are in waves from north-east to south-west, though they have a decided dip to the south-west.

In the river, just below and about one mile below the mouth of Hurricane Branch, there is said to be coal which is doubtless of out-crops of this same seam of coal. On Little Shoal Creek, about one-fourth of a mile from its mouth, or in the S. W. ¼ of S. E. ¼ of S. 3, T. 18, R. 7 W., there is the following out-crop, which is likely of this same seam, (30) of the *General Section:*

Out-Crop on Little Shoal Creek, in the S. W. ¼ of S. E. ¼ of S. 3, T. 18, R. 7 W.

(10)	*Shale;* visible about	12 ft. 0 in.
(9)	CLAY IRON STONE	¾ in.
(8)	*Slate*	5 in.
(7)	COAL	2 in.
(6)	*Slate*	⅛ in.
(5)	COAL	2 in.
(4)	*Slate;* black and hard	½ in.
(3)	COAL; about	1 ft. 0 in.
(2)	*Slate*	4 in.
(1)	*Sandstone;* slabby and flaggy.	

No. (1), as broad, flat rocks, covers the bed of the creek, and is cut up by parallel perpendicular planes of division, which run north-east and south-west and are about fifteen feet apart. This last coal out-cropping is some twelve feet above low water in the river and there is said to be coal in the river just below the mouth of Little Shoal Creek, which is most probably of the *lower group* of this same seam. Coal is also said to be in the river about one mile lower down or at the mouth of Coal Creek which empties into the river about half way between Little and Big Shoal creeks.

Big Shoal Creek has no visible out-cropping of coal on it, so far as it is known, except on its head waters. On one of its head branches or prongs, in the S. W. ¼ of N. E. ¼ of S. 26, T. 18, R. 7 W., there is the following out-crop of (32) of the *General Section:*

Out-Crop in the S. W. ¼ of N. E. ¼ of S. 26, T. 18, R. 7 W.

(5)	*Shale;* cover.	
(4)	COAL; flaggy structure	2 ft. 4 in.
(3)	*Slate*	4 in.
(2)	COAL	4 in.
(1)	*Fire Clay;* forming the bed of the branch.	

This coal out-crop occurs along the foot of a bluff and bed of the branch for one-hundred yards or more, and has a streaked face from the presence of thin seams of mineral charcoal, about four inches apart, along the planes of stratification. The coal easily divides along these seams of charcoal and comes out in flat blocks of the thickness between the seams of charcoal. This out-crop is in long flat waves from north-west to south-east, though it has a general dip of 4° to 5° to the south-west. Near the mouth of this branch, or about one-half mile to the south-west from the above coal out-cropping and some twenty-five feet lower, there is a showing of coal smut about twelve inches thick, eight to ten feet under a very massive sandstone of a reddish gray color. It is (31) of the *General Section.* Still farther to the south, in the road in the S. W. ¼ of S. 35, T. 18, R. 7 W., there is the following out-crop of coal which is of (33) of the *General Section:*

Out-Crop in the Road in the S. W. ¼ of S. 35, T. 18, R. 7 W.

(8)	*Shale;* thick bed.	
(7)	COAL SMUT; seemingly about	2 ft. 0 in.
(6)	*Clay Slate*	4 in.
(5)	COAL SMUT	6 in.
(4)	*Fire Clay*	3 ft. 0 in.
(3)	*Debris;* about	4 ft. 0 in.
(2)	COAL; bony	1 ft. 2 in.
(1)	*Debris.*	

Some three hundred yards east of this last out-crop and fifteen to twenty feet lower, there is on the main branch or prong of Big Shoal Creek, the following coal out-crop which is of the seam below this last one or is (32) of the *General Section:*

Out-Crop in S. E. ¼ of S. W. ¼ of S. 35, T. 18, R. 7 W.

(7)	*Shale;* hard, massive, curly, visible	12 ft. 0 in.
(6)	COAL	1 ft. 2 in.
(5)	*Slate*	½ in.
(4)	COAL; clayey	6 in.
(3)	*Slate*	10 in.
(2)	COAL; cubical	1 ½ in.
(1)	*Fire Clay;* about	2 ft. 0 in.

South-east from this last out-crop about one-quarter of a mile and about five feet higher, there is an other showing of coal which is likely of the same seam. In the public road, on the side of the hill, not far from this last coal out-crop and some sixty to seventy feet above it, there is a showing of about twelve inches of coal smut. This coal smut is likely of (34) of the *General Section.* In this same road, in the N. W. ¼ of N. E. ¼ of S. 3, T. 19, R. 7 W., near the top of the divide on the opposite or south-west side of the creek and some 230 feet above the coal (33) of the *General Section,* there is about two inches of coal smut with a fire clay underbed and a cover of massive sandstones. This smut is likely of (36) of the *General Section,* or the *fire clay seam* as is believed to be the out-cropping of coal, that is visible to a thickness of eleven inches, at a spring under the capping sandstones to this divide, in the N. W. ¼ of N. W. ¼ of the same section. An out-cropping of coal is said to be on a branch in the N. E. ¼ of N. W. ¼ of S. 28, T. 18, R. 7 W., which is the most west-ward of any coal known of on the the waters of Big Shoal Creek. It is likely of (36) of the *General Section.* In the S. E. ¼ of S. W. ¼ of S. 25, T. 18, R. 8 W., near the county line, on Lick Branch, which is a tributary of Indian Creek, there is the following out-cropping of (33) of the *General Section:*

Out-Crop on Lick Branch, in the S. E. ¼ of S. W. ¼ of S. 25 T. 18, R. 8 W.

(7)	*Sandstones*; cover.		
(6)	COAL; *upper group*		1 ft. 1 in.
(5)	*Slate;* very hard, parting, about		4 ft. 0 in.
(4)	COAL	3 in.	*Lower group* 1 ft. 5 in.
(3)	*Slate*	2 in.	
(2)	COAL	1 ft. 0 in.	
(1)	*Slate;* visible		2 in.

On Indian Creek, about one-half mile WNW. from this last coal out-crop, there is said to be more coal which is probably of this same seam, (33) of the *General Section* or the one below, (32) of the *General Section.*

The line between Jefferson and Tuscaloosa counties, on the divide between the waters of Big Shoal, Mud and Valley creeks on the north and Davis Creek on the south, is said to be the *old Talaferro trace* and its exact location, in many places, is not now known, even by the settlers who live along it. Along the county line on this divide, there are very few out-crops of coal known of until the *Little Basin* of the south-eastern edge of the Warrior coal field is approached.

At the spring near *Liberty Church,* in the S. E. ¼ of S. E. ¼ of S. 31, T. 19, R. 6 W., there is an out-cropping of coal, about twelve inches thick, with a thin slate parting near the top, and some sixty feet lower than this spring, there is in the N. W. ¼ of N. W. ¼ of S. 5, T. 20, R. 6 W., a coal pit into the out-crop of a seam of coal which is pronounced to be two feet six inches thick. South-east from this pit some 150 yards, though in the same *forty,* there is an other out-cropping with about twenty inches of coal visible. This coal has a slate parting and is probably of the same seam as that in the above pit. Partly under water, there shows an out-cropping of a seam of coal in the S. W. ¼ of S. W. ¼ of S. 32, T. 18, R. 6 W., which has been considerably surface dug and which is probably of the same seam as the last two out-crops. We take these seams of coal to be of (20) of the *General Section.* Several hundred yards west of the last out-crop, still farther down in the south-west corner of the same *forty*, and some twenty-five feet higher, there is a showing of about twelve inches of coal smut.

A road follows the divide north of Davis Creek, along the county line, and there can be seen to cross it, in the N. E. ¼ of S. 5, T. 20, R. 6 W., a fault which is doubtless of the one that separates the *big* and *little basins*. Along this fault, the *little basin*, together with the adjacent anticlinal limestone valley on the south-east, has been pushed up or the *big basin* side is of a *down-throw*, with the preponderating evidence in favor of the former.

LITTLE BASIN.—This *little basin* is a synclinal trough of somewhat the shape of a canoe or widest at the center and tapering off towards each end. The upper or north-east end is, however, concave or forked. It runs in the general direction of the long narrow anticlinal valleys of the State, from north-east to south-west, and, with the above fault and the south-east edge of the Warrior coal field as its limits, it is about twenty-seven miles long and between four and five miles wide near the center, at its widest part, about where it is crossed by the line between Jefferson and Tuscaloosa counties. The elevated sides, or the south-east and north-west edges of this *little basin* are parts of great anticlinal folds. The one on the south-east side has for its surface rocks, the hard conglomerates and sandstones near the base of the measures, and the one on the north-west side, along the fault, is made up principally of hard sandstones, low down in the measures, though comparatively much higher in the series than those of the south-east rim. Besides the dips to the north-west and south-east of the strata respectively of the south-east and north-west sides, from the synclinal shape or bordering anticlinal folds, the strata along the central longitudinal line of the trough have a general dip to the south-west and are in long flat waves from north-east to south-west. Though the coal out-crops of each side of this *little basin* are, as a general thing, badly covered up or hid, as is usually the case near upheavals and other disturbances of the strata, still in places, especially along the creeks and branches which have cut cross-wise the basin, there are many coal out-crops to be seen. With time and means, there doubtless could be found, above drainage level on the south-east side of the *little basin*, out-crops of most, if not all of the coals from (1) to (25) of the *General Section*, and on the north-west side, within the *little basin* proper or on the south-east side of the anticlinal fold, all of those from (13) to (25) of the *General Section*. The fault or north-west boundary of the *little basin*, is not always along the top of the anticlinal fold of this north-west edge, and hence there sometimes occur on the north-west side of this fold, between it and the fault and so within the *little basin* as above described, out-crops of coal seams which are much higher in the series than any surface rocks within the *little basin proper* or the trough between the anticlinal folds. From the elevation of the country and perpendicular displacement along the fault, the surface strata on the north-west or *big basin* side are higher in the series than the adjoining surface strata on the opposite or south-east or *little basin* side of the fault. Along the central longitudinal line, or the lower or bottom part of the trough or *little basin*, where the strata lie comparatively level and where the surface is composed principally of the strata between (25) and (26) of the *General Section*, there are to be seen very few out-crops of coal. The main visible coal out-crops of the *little basin* proper or between the anticlinal folds, are on the two facing sides or water sheds of the trough and are principally of the three seams, (21), (22) and (23) of the *General Section*.

As have been implied, only the north-east end or half of the *little basin* is in Jefferson county and of this half, we shall now proceed to give a few details, by commencing at the Tuscaloosa line and going around the basin, first up the north-west edge, along the fault and fold between the twc basins, and then down the south-east side back to the Tuscaloosa county line.

On the divide between the head waters of Davis and Mud creeks, near the half-mile line of the southern boundary of S. 4, T. 19, R. 6. W., there are some half dozen test holes which were dug by Col. Giles Edwards, on the out-crops of the coals (21), (22) and (23) of the *General Section*. The following are sections of the out-crops at this point of the lowest of these coal seams, (21) of the *General Section*, or of the New Castle Seam:

Out-Crops of (21) of the General Section, in S. 4, T. 19, R. 6 W.

		1	2	3
(19)	*Shale.*			
(18)	Coal; slaty	4 in.	*Slate* or *Very Slaty Coal.* 1 ft. 2 in.	
(17)	*Slate*; clayey	3 in.		
(16)	Coal	7 in.		Coal .... 7 in.
(15)	*Slate*	6 in.	Coal 1 ft. 1 in.	*Rock*... 6½ in.
(14)	Coal	4 in.		Coal......4 in.
(13)	*Slate*; clayey	7 in.	6 in.	*Rock*......9 in.
(12)	Coal	9 in.	6 in	Coal..1 ft. 0 in.
(11)	*Slate*; black	1½ in.	½ in.	
(10)	Coal	5 in.	4 in.	
(9)	*Clay*	4 in.	½ in.	Streak.
(8)	Coal; soft	1 ft. 4 in.	Coal 2 ft. 2 in.	Coal..5 ft. 0 in.
(7)	*Slate*; clayey	1 in.		
(6)	Coal	7 in.		
(5)	*Slate*	2 in.	5 in.	
(4)	Coal	2 ft. 9 in.	11 in.	
(3)	*Slate*	3 in.	½ in.	3½ in.
(2)	Coal	1 ft. 2 in.	Coal.....6 in. *Slate*.....2 in. Coal.....4 in.	Coal. 1 ft. 6 in.
(1)	*Shale*; underbed	6 in.	1 ft. 6 in.	

No. (1) is the out-crop at the mouth of a drift which has been driven in a short ways on this thick seam. *No.* (2) is its out-crop in a pit about one-hundred yards ENE. of *No.* (1), and *No.* (3) is a reported section by Col. Giles Edwards of the coal within the above drift. An average sample of the full thickness of this seam of coal was collected by Col. Edwards and sent to W. M. Bowron, of South Pittsburg, Tennessee, who analyzed it with the following results:

Volatile Matter	26.55%
Fixed Carbon, estimated	71.35
Fixed Carbon, directly determined	71.28
Ash	2.10
Loss	.07

About sixty yards south-west of the out-cropping of No.(1) of the above sections and some fifteen to twenty feet above its coal seam, there is to be seen, in a pit, an out-cropping of the middle seam of the coal out-crops at this point, or of (22) of the *General Section*, as in (1) of the following sections:

Out-Cropping of (22) *of the General Section,*
in S. 4, *T.* 19, *R.* 6 *W.*

		(1)	(2)	(3)
(14)	*Shale*; cover.			
(13)	COAL	10 in.	12 in.	1 ft. 3 in.
(12)	*Slate*	1½ in.	2 in.	4 in.
(11)	COAL	4 in.	COAL 1 ft. 4 in.	COAL 2 ft. 0 in.
(10)	*Clay*	2 in.		
(9)	COAL	1 ft. 1 in.		
(8)	*Clay*	¾ in.	1 in.	
(7)	COAL	3 in.	COAL 9 in.	
(6)	*Slate*	1½ in.		
(5)	COAL	6 in.		
(4)	*Clay*	1½ in	streak	2 in.
(3)	COAL	5 in.	7 in.	10 in.
(2)	*Clay Slate*	5 in.	4 ½ in	5 in.
(1)	COAL	just visible	3 in	10 in.

Nos. (2) and (3) are sections by Col. Giles Edwards of this same seam, (22) of the *General Section*, in its out-croppings in the same locality as No. (1). This coal is of the same seam as the *Baker's lower bed*, on Lost Creek, in Walker county.

In a pit on the side of the hill about twenty feet above the one in which No. (1) of the above sections occurs, there is the followidg out-crop of the upper of the three coal seams which show at this locality, or of (23) of the *General Section.*

Out-Crop of (23) of the *General Section,*
in S. 4, *T.* 19, *R.* 6 *W.*

(4)	*Sandstone, Shale*; showing about	5 ft. 0 in.
(3)	*Clay Slate*	4 in.
(2)	COAL	1 ft. 2 in.
(1)	*Shale*; just the top visible.	

This out-crop is of the same seam as Baker's *upper bed* of Walker county.

These out-crops or sections, especially of the two upper seams, can not be taken as true representations of the unexposed coal seams. They have a dip of about 15° to the south-east and hence are within the *little basin proper.*

There is to be seen an out-cropping of coal on a creek in the N. E. ¼ of S. 4, T. 20, R. 6 W., and on a branch in the N. W. ¼ of N. E. ¼ of S. 11, T. 20, R. 6 W. The coal of this last out-cropping was partly under water; it was felt down to a thickness of about twenty inches, including a parting of slate. Considerable coal has been taken from both of these out-crops by the neighborhood black-smiths.

In the N. E. ¼ of S. E. ¼ of S. 11, T. 20, R. 6 W., there is the following out-crop:

Out-Crop in the N. E. ¼ of S. E. ¼ of S. 11, *T.* 20, *R.* 6 *W.*

(6)	*Shale*; massive cover.	
(5)	COAL	1 ft. 6 in.
(4)	*Clay Slate*	1½ in.
(3)	COAL	10 in.
(2)	*Slate, Debris;* about	4 ft. 0 in.
(1)	*Sandstone.*	

All of these out-crops dip to the north-west or are on the opposite side of the anticlinal fold from those near the above drift on (21) of the *General Section.*

In Mr. Wesley Parson's field, on the head waters of Mud Creek, in the N. E. ¼ of N. E. ¼ of S. 3, T. 20, R. 6 W., near the line of fault or perpendicular strata between the two basins, there show the out-crops of some half-dozen seams of coal, from a few inches to about three feet in thickness, and varying in dip from about a perpendicularity to about 15° to the south-east. In the north-west corner of S. 34, T. 19, R. 6 W., the strata on the out-crop dip from 45° to 50° to the north-west and in the N. E. ¼ of S. W. ¼ of this same section, there is to be seen an out-cropping of coal. Under a bluff on one of the prongs of Mud Creek in the N. E. ¼ of S. E. ¼ of S. 28, T. 19, R. 6 W., there is the following out-crop:

Out-Crop in the N. E. ¼ of S. E. ¼ of S. 28, T. 19, R. 6 W.

(5)	*Sandstone;* massive bluff.	
(4)	*Shale*	3 ft. 0 in.
(3)	COAL	10 in.
(2)	*Clay Slate*	⅛ in.
(1)	COAL; visible	5 in.

This coal has through its entire thickness, so far as seen, thin sheets of black slate, about every two inches apart, along which the coal easily and cleanly separates, being of a flaggy or columnar structure and breaking out in lumps of the thickness between the thin slate partings. This out-cropping is likely of (33) of the *General Section.*

On top of a high ridge or divide near the center of S. 28, T. 19, R. 6 W., there is a very unusual occurrence in our Coal Measures, namely · A large pond or sink, covering nearly an acre, which, it is said, never goes dry. Along the ravines running up into this divide, the scenery is wild and picturesque, and there are many beautiful water-falls. In one of these ravines, in the S. W. ¼ of N. E. ¼ of S. 28, T. 19, R. 6 W., there is an out-cropping, about two inches thick, of coal smut, and in the N. E. ¼ of N. E. ¼ of the same section, there shows about fourteen inches of coal, likely of (33) of the *General Section,* which is very hard and which breaks up into large cubical and rectangular lumps. The dip of the strata at this last out-crop is about 40° to the north-west.

The fold and fault, between the *big and little basins,* run along close to the Gin 'House, at old Wetona P. O., in the S. E. ¼ of S. E. ¼ of S. 34, T. 19, R. 6 W. There is in the road near the above Gin House and fault, an out-cropping of six to seven inches in thickness of coal smut, and there crosses the creek, in the S. W. ¼ of N. W. ¼ of S. 35, T. 19, R. 6 W., an out-cropping of coal about twelve inches thick. Some seventy-five yards down the creek or branch from this last coal out-crop, or to the north-west, there shows under a bluff the following section :

Out-Crop in the S. W. ¼ of N. W. ¼ of S. 35, T. 19, R. 6 W.

(5)	*Slate;* hard, cover.	
(4)	Coal	4 in.
(3)	*Mother of Coal*	⅛ in.
(2)	Coal	2 ft. 2 in.
(2)	*Slate*; may be a parting, just visible.	

This out-crop has a dip of about 20° to the north-west. It is believed to be of (32) of the *General Section.* In the road in front of Mr. Wm. Parson's residence, there is visible about two feet of coal smut with thin slate partings. It is probably of (33) of the *General Section.* Near Mr. J. B. Parson's, in the N. W. ¼ of S. E. ¼ of S. 25, T. 17, R. 6 W., there show the out-crops of nine to ten seams of coal, which are comprised within (14) to (23), inclusive, of the *General Section.* The upper three seams of these coal out-crops show all along Sharpe's Branch; the lowest and thickest one of them, (21) of the *General Section*, or the *New Castle seam*, in an out-crop in the north-east corner of N. W. ¼ of S. 30, T. 19, R. 5 W., has about the following section:

Out-Crop of (21) of the General Section, in the N. E. ¼ of N. W. ¼ of S. 30, T. 19, R. 5 W.

(17)	*Debris.*	
(16)	Coal Smut	1 ft. 1 in.
(15)	*Clay Slate*	3 in.
(14)	Coal Smut	3 ft. 4 in.
(13)	*Clay Slate*	½ in.
(12)	Coal Smut	4 in.
(11)	*Clay Slate*	1 in.
(10)	Coal Smut	1 ft. 3 in.
(9)	*Clay Slate*	½ in.
(8)	Coal Smut	8 in.
(7)	*Slate*; clayey	1½ in.
(6)	Coal Smut	6 in.
(5)	*Clay Slate*	1 in.
(4)	Coal Smut	1 ft. 1 in.
(3)	*Clay Slate*	2 in..
(2)	Coal Smut	8 in.
(1)	*Fire Clay*; underbed	1 ft. 6 in.

This out-crop has a dip of about 45° to S. 40° E.

Some 150 yards up Sharpe's Branch or S. 40° W. from this last coal out-cropping, there is an out-cropping of the next higher seam, (22) of the *General Section*, or of the Baker's *lower bed* seam of Walker county ; and some 150 yards still higher up the branch both of these thick coal seams make their appearance.

In these out-croppings, the upper of the two thick seams, or (22) of the *General Section*, has the following sections according to Col. Giles Edwards :

Out-Cropping of (22) of the "General Section," in S. 25, T. 19, R. 6 W. and S. 30, T. 19, R. 5 W.

		(1)	(2)
(9)	Coal	1 in.	6 in.
(8)	*Slate*	1 ft. 5 in.	2 ft. 0 in.
(7)	Coal	8 in.	9 in.
(6)	*Slate*; clayey	2 ft. 6 in.	½ in.
(5)	Coal	8 in.	8 in.
(4)	*Slate*	3 in.	6 in.
(3)	Coal,	1 ft. 8 in.	10 in.
(2)	*Slate*; clayey	1 ft. 2 in.	6 ft. 0 in.
(1)	Coal	6 in.	6 in.

No. (1) is of the out-cropping on the south-east side and No. (2), of the out-crops on the north-west side of the anticlinal fold along the north-west edge of the *little basin*.

North-west from these last coal out-crops, about 200 yards, there is an out-cropping of a seam of coal which is considerably lower, or is probably (14) of the *General Section*.

On top of the ridge, near the centre of the S. W. ¼ of S. 25, T. 19, R. 6 W., there is the following out-crop of the coal seam (21) of the *General Section*, or of the *New Castle Seam*, which is known hereabouts as the *big vein:*

Out-Crop of (21) of the Gemeral Section, in the S. W. ¼ of S. 25, T. 19, R. 6 W.

(14)	*Shale.*	
(13)	Coal Smut	6 in.
(12)	*Clay Slate*	4 in.

(11)	Coal Smut	1½ in.
(10)	*Clay Slate*	10 in.
(9)	Coal, *Slate*; irregular	3 in.
(8)	*Clay Slate*	6 in.
(7)	Coal Smut	4 ft. 10 in.
(6)	*Slate*; with streaks of *Coal*; irregular	1 ft. 3 in.
(5)	*Slate*	1 ft. 7 in.
(4)	Coal Smut	3 ft. 8 in.
(3)	*Clay Slate*	5 in.
(2)	Coal Smut	5 in.
(1)	*Slate;* underbed.	

This out-crop has a dip of about 80° to N. 55° W.

In the neighborhood of this last coal out-crop, or on the head waters of Dry Branch, in S's 25 and 24, there are to be seen out-crops of many of the coals from (14) to (33) of the *General Section.* Near the center of S. 24, the *black band ore* over the *big vein,* or (21) of the *General Section,* shows about two feet in thickness.

In the road near Mr. I. B. Parson's, in the south-east corner of N. E. ¼ of N. W. ¼ of S. 19, T. 19, R. 5 W., there is to be seen smut of the coals (14), (15) and (22) of the *General Section.* In about four-fifths of a mile along Suck Creek, near Mr. Parson's, there are to be seen out-crops of the following approximate section, which shows all, with perhaps one or two thin exceptions, of the coal seams that crop out in or near the *little basin:*

Approximate Section of the Coal Out-Crops along Suck Creek, for about four-fifths of a mile in S's 18 *and* 19, *T.* 19, *R.* 5 *W.*

	Measures; to top of mountain or the divide between the waters of Valley and Mud Creeks	50 ft.
(18)	Coal; Rainey and Bryant beds, (37) of the *General Section.* It has slate partings. Dip about 4° to the N. W. About	7 ft.
	Measures; they doubtless contain several seams of *coal*	250 ft.
(17)	Coal; believed to be (33) of the *General Section*	3 ft.
	Measures; they likely contain some thin *coal* seams. Lower strata dip 25° to N. W. About	100 ft.
(16)	Coal; believed to be of (30) of the *General Section*	2 ft.
	Measures; with their central strata perpendicular. About	275 ft.

	BLACK BAND; of undetermined thickness.		
	Measures; about	65 ft.	
(15)	COAL; probably (28) of the *General Section*	8 ft.	
	Measures; about	100 ft.	
(14)	COAL; thought to be a repetition of (11) below	2 ft.	
	Measures; about	50 ft.	
(13)	COAL; thought to be a repetition of (10) below, reported	3 ft.	
	Measures	150 ft.	
(12)	COAL	1 ft.	
	Measures; may contain some thin sheets of *coal* and a *fault*. Dip 85° to N. 50° W. About	400 ft.	
(11)	COAL; (23) of the *General Section*, Baker's *upper bed*	2 ft.	
	Mesures	35 ft.	
(10)	COAL; (22) of the *General Section*, Baker's *lower bed*.	6 ft.	
	Mesures	15 ft.	
	BLACK BAND	1 ft. 10 in.	
	Measures	12 ft.	
(9)	COAL; (21) of the *General Section, Big vein, New Castle seam*, it has slate partings. Dip, 65°to N.50° W. Said to have a parting, two feet thick, of sandstone, but to contain fourteen feet of coal	14 ft.	
	Measures; they very likely contain some thin seams of coal, and perhaps the seam of *black band* that occurs below the *New Castle seam*.	150 ft.	
(8)	COAL; (17) of the *General Section*	2 ft.	
	Measures	25 ft.	
(7)	COAL	1 ft.	
	Measures	35 ft.	
(6)	COAL; (14) of the *General Section*, the *Jefferson seam*	4 ft.	
	Measures; about	20 ft.	
(5)	COAL; (13) of the *General Section, Black Creek seam*. Reported	6 ft.	
	Measures	50 ft.	
(4)	COAL	1 ft.	
	Measures	60 ft.	
(3)	COAL	1 ft.	
	Measures; about	100 ft.	
(2)	COAL SMUT; about	6 in.	War. Seam. 23 ft. 10 in.
	BLACK BAND	1 ft. 0 in.	
	COAL SMUT; about	6 in.	
	Measures; debris	8 ft. to 10 ft. 0 in.	
	BLACK BAND; shaly	1 ft. to 1 ft. 2 in.	
	Debris; streaks of *black band*, about	10 ft. 0 in.	
	COAL, BLACK BAND; visible about	8 in.	
	Measures; may contain a seam of coal, about	30 ft. 0 in.	
(1)	COAL; believed to be (9) of the *General Section*. Dip, 35° to N. 45° W	3 ft. 0 in.	
	Measures; to crest of the anticlinal fold next to the *little basin* proper, about	275 ft. 0 in.	

This section is of out-crops without the *trough* or *little basin proper*, or of out-crops to the north-west of the anticlinal fold along the north-west edge of the *little basin*. As the central strata between (15) and (16) of this section are perpendicular and the coals (13) and (14) are believed to be repetitions respectively of the coals (10) and (11), there is thought to be a fault and sharp folding ol the strata here, in which some of the strata between (11) and (16) of the above section are doubled, while others are entirely wanting. The strata of the above section increase in their dip to the north-west as the creek is gone up from the crest of the anticlinal fold, or from the lowest stratum, until the perpendicular strata between (15) and (16) are reached, where the dip, for a short distance up the creek, is reversed to the south-east, but it soon changes back to the north-west and rapidly flattens until a dip of 4° to 5° to the north-west is reached. The crest of the anticlinal fold of the north-west edge of the *little basin* crosses Suck Creek in the N. W. ¼ of N. E. ¼ of S. 19, T. 19, R. 5 W., or about one-fourth of a mile from its mouth. The top of this fold, as seen along the bed of the creek, is perfect or is unbroken.

In the out-crops of the above section, the Jefferson seam, or (6) of that section, shows about as follows:

(11)	*Shale;* cover.	
(10)	Coal Smut	3 in.
(9)	*Slate*	1 in.
(8)	Coal Smut.	9 in.
(7)	*Clay Slate.*	6 in.
(6)	Coal Smut	8 in.
(5)	*Slate*	6 in.
(4)	Coal Smut	1 ft. 4 in.
(3)	*Slate*	5 in.
(2)	Coal Smut	5 in.
(1)	*Clay Slate.*	

Mr. J. B. Parson's cut across the out-cropping of this seam of coal, in digging a ditch in his field, and reports it to have the following section:

(3)	Coal Smut	3 in.
(2)	*Slate*; with thin streaks of coal	2 ft. 0 in.
(1)	Coal Smut	4 ft. 0 in.

Along Bee Branch, in the W. ½ of S. 17, T. 19, R. 5 W., there are to be seen out-crops of some of the coals near the perpendicular rocks or the fault; and at the mouth of this branch, or at the crossing of Big Blue Creek by the public road, in the S. E. ¼ of N. W. ¼ of S. 17, T. 19, R. 5 W., the strata have a dip of 25° to 30° to the north-west, and are between the crest of the fold and the fault. Where the perpendicular rocks or fault cross Valley Creek, in the N. E. ¼ of N. E. ¼ of S. 10, T. 19, R. 5 W., there is an almost perpendicular water-fall of between four and five feet, over hard, flaggy and slabby sandstones, which have a strike of about S. 30° W.

The out-cropping of the *Black Band* between (9) and (10) of the above section along Suck Creek, shows about as follows:

(7)	*Shale*; cover.	
(6)	BLACK BAND	2 in.
(5)	*Slate*; ferruginous	8 in.
(4)	BLACK BAND	1 ft. 5 in.
(3)	*Slate*; clayey and ferruginous	2 in.
(2)	BLACK BAND	1½ in.
(1)	*Shale*; arenaceous and irony.	

The out-cropping of the seam of Baker's *lower bed*, or (10) of the above section along Suck Creek, is about as follows:

(7)	*Shale*, cover.	
(6)	COAL SMUT; with thin streaks of slate	2 ft. 8 in.
(5)	*Clay Slate*	2 in.
(4)	COAL SMUT; with streaks of slate	1 ft. 5 in.
(3)	*Clay Slate*	4 in.
(2)	COAL SMUT.	6 in.
(1)	*Shale*.	

In the bed of Big Blue Creek, in the N. W. ¼ of N. W. ¼ of S. 20, T. 19, R. 5 W., there is said to be an out-cropping, from which considerable coal has been raised for blacksmith use in the settlement. About 200 yards still farther to the E S E., there is an out-cropping of coal which has a dip of about 30° to the south-east; and, in the south-east corner of S. 17, T. 19, R. 5 W., there is an out-cropping of (21) of the *General Section*, or of the *big vein* or *New Castle seam*, which, though partly covered by water, appears to be some fifteen to sixteen feet thick, and to have about twelve to fourteen feet of coal. This out-cropping has a dip of 25° to 30°, to S. 50° to 60° E. The coal between the slate partings is pure and good; it breaks out in large lumps which do not easily crumble on exposure and handling, but stands weathering finely, and would be well suited to stocking. About fifty yards south-east of this out-crop, there is a showing of the next higher seam, (22) of the *General Section*, or of the same seam as the Baker's *lower bed* of Walker county, about as follows:

Out-Crop of (22) *of the General Section, in the S. E. corner of S.* 17, *T.* 19, *R.* 5 *W.*

(10)	*Shale;* fossiliferous.	
(9)	Bony Coal; with streaks of slate	9 in.
(8)	Coal Smut	11½ in.
(7)	Mother of Coal; only in places	¼ in.
(6)	Coal Smut	7½ in.
(5)	*Slate*	4 in.
(4)	Coal Smut	3 in.
(3)	*Slate*	½ in.
(2)	Coal Smut	6½ in.
(1)	*Fire Clay.*	

Near the central longitudinal line or lowest part of this synclinal basin or trough, there is in the road near the center of the N. E. ¼ of S. 21, T. 19, R. 5 W., a thin showing of coal smut, and in a branch, close by and a few feet lower, there is said to be a thick out-cropping of coal. These out-crops may be of (23) and (22) of the *General Section.*

The upper or north-east end of this *little basin* proper, or that portion of it between the anticlinal folds, lies just south of Valley Creek and is concave in shape, as can be seen by the dip of the strata along the public road, as it runs through S's 16, 22 and 23, T. 19, R. 5 W. Along this road in S. 16, T. 19, R. 5 W., there are several thin out-croppings of coal smut and in the well, at Monroe Hausman's old place, in the N. W. ¼ of S. E. ¼ of S. 16, T. 19, R. 5 W., there is said to be a seam of four feet in thickness, it is likely (22) of the *General Section.*

The massive conglomerate between (17) and (18) of the *General Section,* crops out for some 500 to 600 yards along the south bank of Valley Creek just below the mouth of Little Blue Creek, or in the S. W. ¼ of S. 15, T. 19, R. 5 W. The lower three to four feet of this conglomerate is full of pebbles, many of which are of a black or dark color. These conglomerates do not cross the creek at this point and are doubtless cut off by a cross fault or a fault running north-west and south-east along Valley Creek. Their strike and dip go to prove the concave shape of the upper end of the *little basin.*

In the public road on the north side of Valley Creek in the N. E. ¼ of N. W. ¼ of S. 15, T. 19, R. 5 W., there is an out-cropping of coal smut about twelve inches thick, with clay slate above it for two feet, then an other streak of coal smut. In the south bank of Valley Creek, just across from Hamaker's old mill, now the Widow Jones' mill, and just below the mill dam, in the north-east corner of S. 15, T. 19, R. 5 W., there is an out-cropping of coal about six feet thick, including two partings of slate. Some forty inches above this coal, there is a streak of coal about four inches thick. The strata at this out-crop have no regular dip or in fact are very irregular in every respect. The following however is a section of this out-cropping:

Out-Cropping on Valley Creek at the Widow Jones' Mill, in the North-East Corner of S. 15, T. 19, R. 5 W.

(11)	*Shale.*	
(10)	*Sandstone;* gray, very hard, forming a ledge	3 ft. 0 in.
(9)	*Shale;* about	15 ft. 0 in.
(8)	COAL; slaty	4 in.
(7)	*Fire Clay;* hard and fossiliferous	3 ft. 4 in.
(6)	COAL	1 ft. 2 in.
(5)	*Fire Clay;* hard	1 ft. 3 in.
(4)	COAL	2 ft. 4 in.
(3)	*Slate;* with several irregular streaks of *coal* in its upper part.	8 in.
(2)	COAL	8 in.

(1) *Sandstone*; slabby and micaceous, and of a dark gray color. Dip, about 45° to the N. W. Showing to water level, about ....6 ft. 0 in.

From the above mill, there commences and runs in a north-east direction, a ridge with a ledge along its top or a *back-bone* of a white glistening coarse grain conglomerate, like that at the base of the measures, without any large pebbles, but, in places, it is full of small pebbles. These rocks on the out-crops frequently easily crumble into a beautiful white sand of sharp coarse grains, and have their dip reversed until it is 75° to 80° to the south-east. This ridge does not extend to the north-east more than two miles when it curves to the right or east and forms an *unbroken crook*, as it were, with the ridge along the south-east edge of the Warrior coal field. To this ridge or point extending down to the above mill, may be due the concavity of the upper or north-east end of the *little basin.* In the bend of the above crook, there are two parallel but smaller ridges. Just north of the rounded end of this crook, the public road passes through a gap in a small ridge, which was cut out by Lick Creek, and which is known as the *narrows* or *turn-pike.* The rocks of these narrows have a strike of N. 15° W. and a dip of 50° to 60° to the south-west, and are believed to be near the fault which separates the *little* and *big basins.* A fault may pass through this gap. In a ridge just south-east of these narrows, the rocks appear to be almost flat. The handle of the above crook, or Rock Mountain or the ridge along the south-east edge of the Warrior coal field, crosses Valley Creek at *Bullard's Shoals*, about one-half mile above or east of the Widow Jones' Mill. At these shoals, the rocks are very much broken up and have no uniformity of dip or strike. The great confusion of the strata at this point may be due to the crossing of two faults, one of which runs in a general north-east and south-west direction and the other in a general north-west and south-east direction. The conglomerates at the base of the measure which form *Rock Mountain* and *Bullard Shoals*, occur along Valley Creek several hundred yards higher up on the southern than on the northern bank or than the shoals. Next to them up the creek or on the south-east or anticlinal valley side and on the opposite side of the line of the supposed great north-east and south-west fault which runs along the south-east edge of the Coal Measures, the country, for a width of several hundred yards, is low and flat and has no bedded rocks to be seen, though it has loose pieces of *Lower Silurian* rocks, chert and sandstone, scattered over the surface. At the ford about one-quarter of a mile up the creek from the shoals, there is a ledge of a deep blue limestone across the creek, which has a strike of about N. 8° E. and a dip of about 75° to the WNW. As *Lower Silurian* rocks appear to jut up against the conglomerates of the Coal Measures, here at the Bullard Shoals, it is believed that all of the intermediate strata are swallowed up in a great north-east and south-west fault.

The conglomerates between (17) and (18) of the *General Section*, which show so plainly along the south bank of Valley Creek just below the mouth of Little Blue Creek, is not to be seen elsewhere along either of these creeks, though on the side of the ridge, on the east side of Little Blue Creek, near the ford in the N. W. ¼ of S. E. ¼ of S. 22, T. 19, R. 5 W., there are scattered over the surface a few loose small rounded flint pebbles, which probably came from the disintegration of this conglomerate. In the road just west of the above ford across Little Blue Creek, there is an out-cropping which shows about fourteen inches of coal smut, and, one foot above this coal smut, about two inches of *black band iron ore.* Some seventy-five yards south-west of this out-crop, there is in the old road a thin showing of coal smut with slate partings. Some three hundred yards still farther down this road, to the south-west, there is more coal smut; this last shows to a thickness of about twelve inches. North of this last coal smut, some 250 yards, in an other road, there is a coal out-crop which is believed to be of the thick seam (21) of the *General Section.* About seventy-five yards still higher up this last road or to the north, there is an out-cropping of coal, which has slate partings and is likely of the seam just over the last or is (22) of the *General Section.* In Little Blue Creek, at the mouth of Coal Branch in the S. E. corner of the N. W. ¼ of S. 27, T. 19, R. 5 W., there is an out-cropping of coal, doubtless (11) of the *General Section*, which is said to be good and thick and from which much coal has been raised for black-smithing purposes in the neighborhood. Coal is said to occur in Coal Branch, at intervals, for its whole length. These coal outcrops are all likely of the same seam as the out-crop, just spoken of, in Little Blue Creek, at the mouth of Coal Branch.

Parallel to and about one-half mile north-west of Rock Mountain is a ridge of massive sandstones. From under these sandstones there crops out in the road, in the N. W. ¼ of S. E. ¼ of S. 27, T. 19, R. 5 W., a seam of coal which shows to a thickness of about fourteen inches.

Little Blue Creek rises in the anticlinal valley, which is here Jones' Valley, and cuts through Rock Mountain into the Coal Measures, near the half-mile line in the northern part of S. 34, T. 19, R. 5 W., in what is known as the *narrows*. This channel through Rock Mountain has certainly the right name, for though, in its windings, it is one-half mile long and is 100 feet or more deep, it is not more than forty feet wide. At the head of these *narrows*, the conglomerates in the bed of the creek have a dip of only 50° to 60° to the north-west, though these same rocks along the top of the mountain, on each side of the *narrows*, dip as much as 80° to the north-west. Along these narrows, there is some very wild and picturesque scenery. Next to Rock Mountain on the south-east or anticlinal valley side, near the above narrows, there is a valley several hundred yards wide, in which there is to be seen no rocks, and then comes a parallel cherty ridge, on the north-west side of which there were found a few fossiliferous or Sub-carboniferous cherty rocks, though the great body of this chert is non-fossiliferous.

Lower down Rock Mountain, or in the N. W. ¼ of S. E. ¼ of S. 4, T. 20, R. 5 W., the ledge of conglomerates, or *millstone grit*, along the top of the mountain has a strike of about S. 40° W. and a dip of about 50° to the north-west. At the foot of Rock Mountain, on the north-west side, in the south-east corner of the N. W. ¼ of S. 4, T. 20 R. 5 W., there issues from strata, not a great ways over this conglomerate, a spring of strong chalybeate water, which likely comes from a seam of coal.

In the east fork of Big Blue Creek, in the N. W. ¼ of N. W. ¼ of S.4 T.20, R. 5 W., there is a reported out-cropping of coal, and in the south-east corner of S. 32, T. 19, R. 5 W., there is a coal out-cropping which has partings of slate. This last coal out-cropping has a dip of about 20° to the N. 60° W. In this same East Fork of Big Blue Creek, in the N. E. ¼ of S. E. ¼ of S. 32, T. 19, R. 5 W., and in the field just east of the creek, along a line running abot N. 40° E., there are several out-croppings of a seam of *black band ore*, which shows to a thickness of about sixteen inches. Along a parallel line, some forty to forty-five yards south-east of the one of the out-crops of the above *black band ore*, there are, in the creek and in the field, several out-croppings of a seam of coal, which appears to be four or more feet in thickness and which is likely (11) of the *General Section.* From the out-crop of this coal seam in a deep hole in the creek, there is said to have been washed up lumps of coal several feet in diameter. This is probably the same seam of coal as has already been spoken of as cropping out in many places along Coal Branch and in Little Blue Creek at the mouth of Coal Branch. This East Fork of Big Blue Creek, both above and below these out-cropping of *black band ore* and coal, is made up of pools of deep holes of water, which are separated by *falls* or *cascades* formed by highly inclined ledges of the harder rocks. In one of these pools, about 100 yards higher up the creek than the one in which occurs the out-cropping of the seam of coal just spoken of, there is said to be more coal; it is of (9) or (10) of the *General Section.* The above seam of *black band ore* was traced as far north-east as the N. W. ¼ of N. W. ¼ of S. 27, T. 18, R. 5 W., where, in an out-crop, it measures about sixteen inches in thickness. The thin out-cropping of *black band ore* seen in the public road near the crossing of Little Blue Creek, in the N. W. ¼ of S. E. ¼ of S. 23, T. 19, R. 5 W., may be of this same seam, though it is believed to be above it. On the side of this same road, in front of Anderson Taylor's, colored, there is an out-cropping of the thick seam, (21) of the *General Section,* which is here said to be about nine feet thick and to have about seven feet of coal. At this out-cropping the coal has a dip of about 30° to the north-west.

Still farther to the west, along this road, in a ditch on the side of the road, in the N. E. ¼ of N. E. ¼ of S. 28, T. 19, R. 5 W., there is the following out-cropping of the coal seam (22) of the *General Section*:

Out-Crop in the N. E. ¼ of N. E. ¼ of S. 28, *T.* 19, *R.* 5 *W.*

(9)	*Shale.*	
(8)	Coal Smut	1 in.
(7)	*Clayey Slate*	3 in.
(6)	Coal Smut	1 in.
(5)	*Clay Slate*	1½ in.
(4)	Coal Smut	10 in.
(3)	*Clay Slate*	9 in.
(2)	Coal Smut	1 ft. 9 in.
(1)	*Clay*	6 in.

From this out-cropping westward to Mr. Jacob Sharpe's, in the N. W. ¼ of N. W. ¼ of S. 32, T. 17, R. 5 W., there show in the above road several out-croppings of the coals (21), (22) and (23) of the *General Section.* South of this road, in an old field, in the S. E. ¼ of S. E. ¼ of S. 29, T. 19, R. 5 W., there is the out-cropping of the coal seam (21) of the *General Section,* which is known as the "*Hanby coal bed.*" In the gullies of the old field in front of Mr. Sharpe's residence, there are numerous out-croppings of these coals, (21), (22) and (23) of the *General Section,* and of two thin streaks of coal, respectively forty and sixty feet above (23) of the *General Section.* In one of these out-crops, the one on the side of the road at the corner of the fence, about 200 yards north of Mr. Sharpe's, the thick seam, (21) of the *General Section,* shows about as follows:

Out-Crop of (21) *of the General Section,*
in the N. W. ¼ of N. W. ¼ of S. 32, *T.* 19, *R.* 5 *W.*

(20)	*Debris.*	
(19)	*Shale;* clayey	5 in.
(18)	Coal Smut	2 ft. 3 in.

(17)	*Slate*	streak.
(16)	Coal Smut	6 in.
(15)	*Clay Slate*	¾ in.
(14)	Coal Smut	1 ft. 1 in.
(13)	*Clay Slate*	2 in.
(12)	Coal Smut	1 ft. 0 in.
(11)	*Clay Slate*	1 in.
(10)	Coal Smut	2½ in.
(9)	*Clay Slate*	¾ in.
(8)	Coal Smut	5 in.
(7)	*Clag Slate*	¾ in.
(6)	Coal Smut	2 in.
(5)	*Clay Slate*	½ in.
(4)	Coal Smut	3 in.
(3)	*Clay Slate*	1½ in.
(2)	Coal Smut	1 ft. 3 in.
(1)	*Clay Slate.*	

The lines of these coal out-crops cross Big Blue Creek just below the fork, in the S. E. ¼ of N. E. ¼ of S. 31, T. 19, R. 5 W., and show on the opposite or west side of the creek, on the side of the hill. In one of these out-crops on the west side of the creek, the thicker or lower seam, (21) of the *General Section*, shows about as follows:

Out-Crop of (21) *of the General Section,*
in the S. E. ¼ of N. E. ¼ of S. 31, *T.* 19, *R.* 5 *W.*

(9)	*Debris.*	
(8)	Coal Smut	5 in.
(7)	*Slate;* about	8 in.
(6)	Coal Smut	4 ft. 2 in.
(5)	*Slate*; about	8 in.
(4)	Coal Smut	4 in.
(3)	*Slate*	1 in.
(2)	Coal Smut	1 ft. 0 in.
(1)	*Fire Clay*	3 ft. 0 in.

In one of these out-crops on the west side of Big Blue Creek, the middle of the three principal seams of these out-crops, or (22) of the *General Section*, shows about as follows:

Out-Crop of (22) *of the General Section, in the S. E. ¼ of N. E. ¼ of S.* 31, *T.* 19, *R.* 5 *W.*

(5)	*Shale.*	
(4)	COAL SMUT	1 ft. 0 in.
(3)	*Clay Slate*	1 in.
(2)	COAL SMUT	3 ft. 2 in.
(1)	*Fire Clay.*	

Under these coal seams, there is a carbonaceous gray sandstone which crosses the creek just below the fork, and under this sandstone there is said to have once showed, on the west bank of the creek, a thick out-cropping of coal, but of this we are very doubtful. The dip of these coal out-crops is from 15° to 20° to N. 20° W.

Just south-east of the above coal out-crops, there is a ridge on which Mr. Sharp's house stands. This ridge, as seen where it is cut through by the east prong of Big Blue Creek, owes its existence to a massive gray and red sandstone, in which were seen some dark siliceous pebbles. These sandstones are full of cavities, with incrustaticns of seemingly scales of flinty or siliceous matter of a *pearly* look, of the shape or form of bivalve shells. These rocks are likely the conglomerates between (17) and (18) of the *General Section.* Parallel to this ridge and south-west of it, nearly one-fourth of a mile, is the line of the out-crops of the *black band ore* over (21) of the *General Section.*

On a branch in the S. W ¼ of S. 31, T. 19, R. 5 W., there is an out-cropping about five inches thick of *black band ore,* which has a dip of about 25° to the N.20° W. This *black band ore* is believed to be of that between (18) and (19) of the *General Section.*

About three-fourths of a mile up the branch from this last *black band ore* out-cropping, there is said to be an out-cropping of coal; and about one-fourth of a mile down the branch from it, or to NEN., there is reported to be a showing of the thick coal seam, (21) of the *General Section.*

We have seen out-croppings of coal in the following *sections* in that part of the Warrior coal field which is in Jefferson county:

Sections,	17, 23, 24	T. 14,	R. 2,	W.
"	7, 12, 13, 14, 15, 23, 24, 25, 26, 27, 35, 36	" "	" 3,	"
"	12, 17, 24	" 15,	" 2,	"
"	7, 11, 12, 13, 17, 18, 20, 29, 31, 32, 34, 35	" "	" 3,	"
"	12, 31	" "	" 4,	"
"	35, 36	" "	" 5,	"
"	8, 17, 18	" 16,	" 2,	"
"	2, 3, 5, 6, 8, 10, 14, 15, 20, 23, 31, 32, 33, 34, 35	" "	" 3.	"
"	2, 3, 4, 8, 9, 15, 19, 20, 21, 22, 23, 25, 26, 28, 30	" "	" 4,	"
"	1, 9, 10, 11, 13, 14, 15, 16, 21, 22, 24, 25, 26, 27, 28, 30, 31, 32, 33, 34	" "	" 5,	"
"	25, 26, 36	" "	" 6,	"
"	2, 4, 9, 14, 15, 17, 19, 22, 30	" 17,	" 3,	"
"	1, 2, 12, 32	" "	" 4,	"
"	4, 6, 7, 8, 9, 12, 18, 19, 20, 31	" "	" 5,	"
"	1, 2, 3, 4, 10, 12, 15, 20, 22, 24, 25, 29, 30, 34, 35, 36	" "	" 6,	"
"	1, 2, 10, 11, 16, 20	" 18,	" 4,	"
"	5, 6, 7, 10, 11, 13, 17, 19, 20, 31, 34	" "	" 5,	"
"	2, 3, 4, 5, 7, 8, 9, 10, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30, 33, 34, 35	" "	" 6,	"
"	2, 3, 9, 10, 12, 26, 28, 35	" "	" 7,	"
"	24, 25	" "	" 8,	"
"	2, 3, 10, 11, 15, 16, 17, 18, 19, 20, 21, 22, 27, 28, 29, 30, 31, 32, 33	" 19,	" 5,	"
"	3, 4, 9, 10, 11, 12, 13, 15, 16, 17, 23, 24, 25, 28, 31, 32, 33, 34, 35, 36	" "	" 6.	"
"	3	" "	" 7,	"
"	4	" 20,	" 5,	"
Sectiens	4, 8, 11	T. 20.	R. 6,	W.

8. TUSCALOOSA COUNTY.

Tuscaloosa County has an estimated area of 1,390 square miles, of which nearly five-sevenths, or about 965 square miles is of the Coal Measures or is of the Warrior Coal Field. These measures are of the north-eastern part of the county, and may be said to make up all of the county north-east of a line drawn through the city of Tuscaloosa from the north-west to the south-east corner of the county, with the exception of about twenty-five square miles in the anticlinal valley, or Roup's valley, along the south-east border of the county. They form the south-west end of the great Appalachian coal field, so far as it can be seen or as it becomes covered up by a newer formation. The above line of division running through the city of Tuscaloosa is not an exact one, as along this line the Coal Measures are to be seen only on the water courses, where the overlying Stratified Drift has been removed by denudation, and the capping Drift covers some of the divides for a long ways north-east of this line. The true south-west boundary line of the visible Coal Measures of the Warrior or Appalachian field, is therefore broken or jagged. How far the covered measures of the south-west end of the above coal fields extend to the south-west or the extent of this covered area, is now unknown and will most probably be so for a long time to come.

In the following pages, we propose to consider only the part of the county that is north-east of the above dividing line through the city of Tuscaloosa, or only the Coal Measures of the county.

TOPOGRAPHY, ETC.

The topographical features over the Coal Measures of Tuscaloosa county are similar in a general way to what they are over the *basin area* of the Warrior coal field, and hence an often repeated description of them, need not be given here in detail. The irregularities of surface may be said to be all due to erosion. As there is a winding river which runs through the county from north-east to south-west, and as there are large streams which rise in the elevated highlands and empty into the river from both sides, and as the measures are composed of alternate layers of softer and harder strata, the irregularities of surface are great and the scenery is varied and picturesque. The streams all have a great fall; that of the river as it passes through the Coal Measures of this county, or in a winding course of less than thirty miles, has a fall of over 100 feet.

The soils of this area are also similar to what they are over other parts of the Warrior coal field.

The greater part of this area is well watered with the best and purest of water, and during three-fourths of the year is one of the finest of ranges for cattle and sheep. It is still covered for the most part with its native growth of pine, oak, gum hickory, bay, etc., etc. The principal *clearings* are near the south-west edge, where all of the divides have a capping of Drift soil.

GEOLOGICAL FORMATIONS.

This north-eastern part of the county, as already stated, is made up almost entirely of the *Coal Measures*, though besides the capping *Drift*, principally of the south-west side, there are, in the anticlinal valley along the south-east border, out-croppings of *Sub-carboniferous*, *Devonian* and *Silurian* rocks. We shall, now, however, consider only the Coal Measures.

COAL MEASURES.

The Coal Measures of this county are believed to be thicker than in any other part of the Warrior field, or in any other field of the known world. The strata as a whole, have a general dip to the SWS., and, as this dip of 3° to 4° is greater than the inclination of the surface, the measures thicken to the south-west, hence, we believe that the most south-western visible strata are the upper-most ones in the series, or that the most southwestern of the visible measures are the thickest. Provided the different strata retain the thickness of their out-crops, we believe that they, at and near Tuscaloosa, as they become covered up by the Drift, have a combined thickness of over 3,000 feet. These measures are of the south-west end of a great synclinal trough, which has doubtless given to the Warrior River its general course through the Coal Measures of this county. In addition to the general dip to the SWS., the strata of the north-west side have a general dip to the ESE., and those of the south-east side, a general dip to the WNW., as would naturally be supposed from the trough shape of the area. These lateral dips, or general dips to the ESE. and WNW., are greater than the longitudinal dip or the general dip to the SWS.; they are from 7° to 8°, though they are sometimes much greater than this. In addition to these general dips, the strata are in long waves in the general directions of these dips, or, in other words, those of the bottom of the trough wave in the general direction of the trough, or from the NEN. to the SWS., while those of the two sides wave in a perpendicular direction to the trough, or from the WNW. to the ESE. Unlike the general dips, the waves of the bottom of the trough are much greater than those of the sides, and are especially large near the south-west end of the trough, where they, in several instances, reach a height of thirty to forty feet or more, or become regular anticlinal folds of gentle elevations.

Along the north-east edge of these measures, or next to the anticlinal valley, is the *Little Basin.* The south-west half of this *little basin* is in this county and the north-east half is in Jefferson county. It is cut off from the rest of the Warrior coal field or from the *big basin*, as has been stated, by a combined fault and folding. Along this fault, there has been a great vertical displacement of strata, either by a *down-throw* of the west or *big basin* side or, as is more likely, by an upheaval of the east or *little basin* side. The measures are especially complicated near the two ends of this *little basin.*

These measures, as in all parts of our coal fields, consist of a series, in alternate layers, of (1) *Sandstones, Conglomerates,* (2) *Shales, Slates,* (3) *Clays,* (4) *Stone Coals,* and (5) *Carbonaceous Limestone,* in thin seams, at several horizontal positions.

These rocks, as they are similar in character to corresponding rocks in other parts of the Warrior coal field, and as they have been fully described under other counties, need not be dwelt upon extensively here, with the exception of the stone coals.

The great body of the surface area of the Coal Measures of this county are of strata of the *Upper Measures,* though rocks of the *Lower Measures* do occur along the eastern border or the anticlinal valley. These measures have their most massive rocks in the conglomerates and sandstones near the bottom and top or in the conglomerates of the *Lower Measures* and those at the very top of the *Upper Measures,* hence these measures might properly be termed the *inter-conglomerate me sures.*

The sandstones are massive, flaggy, slabby and shaly in structure; coarse and fine grain, hard and soft, and compact and friable in texture; and of light, yellowish, grayish, pinkish and reddish colors. The massive sandstones are frequently fine building stones, which are tough and split or work with equal ease in any direction. The flagstones are often all that could be asked of them; they are of all degrees of thickness and have perfectly smooth and beautifully ripple marked sides. These flagstones, frequently in the the faces of the quarries and in the banks and beds of the streams, occur in strata of such great regularity as to look like planks piled up, one on an other, and hence they have received the name in certain localities of *plank rocks.* The conglomerates are mainly massive, though some of them are inclined to be slabby. They as a general thing have most of their pebbles confined to streaks and patches in their lower parts, though sometimes the pebbles are distributed universally through the massive rocks. These pebbles are of flint, with a few exceptions which are of ferruginous sandstones, and are usually small and well rounded, though occasionally they are from one-half of an inch to an inch in diameter and are rather angular with smoothed or rounded edges. The conglomerates occur at about eleven different horizons, but, in four to five of these positions, they are conglomerates only in certain localities, at other times they are merely coarse grain quatzose sandstones. As stated, the most massive of these conglomerates are near the bottom and top of the series, where they crop out as high and precipitous bluffs and as bare *rocky plaines* almost destitute of vegetation. The shales, slate and clays are similar to what they are in other parts of the Warrior coal field. In the shales, there is frequently to be seen, in greater or less quantities, *clay iron stone* of both the concretionary and stratified varieties.

Stone Coals. There are in these measures some fifty-three seams of coal, which vary in thickness from about two inches to fourteen feet and which have an aggregate thickness of about 125 feet of pure coal. Of these fifty-three coal seams, twenty-five are of workable thickness or contain eighteen inches and over of pure coal; of these twenty-five seams, fourteen have two feet six inches and over of coal; of these fourteen seams, nine have over four feet of coal; and of these nine seams, three have more than six feet in thickness of coal. The thicker of these seams, however, contain interstratified partings of slate and clay, which render it utterly impossible to cleanly mine the coals of some of them. The coals therefore of these thick dirty seams, to be available, will have to be crushed and washed. Among these coals are to be found seemingly almost every variety of bituminous coal; some of them are bright and hard and are well adapted to handling and stocking, while others are of a duller color and are of a friable and crumbly nature; some of them appear to be especially fitted for coking and black-smithing purposes, while others might be called steam or heating coals and others still, gas coals. Some have a vertical flaggy structure or a regular *face and butt* structure, while others are divided up by joints into cubical and rhomboidal blocks, and others still are solid and compact throughout. Those of the flaggy and jointy structures can be mined much more easily and in much larger lumps than the solid and compact coals, but then they, as a general thing, crumble much more easily. Some of these coals are very pure coals or contain but a very small amount of ash and clinker, while others are bony and slaty. They, as a general thing, are free burning coals and most of them contain thin sheets of mineral charcoal. Nearly all of them have been judged of merely from their exposed out-crops and the analyses that have been made of them, with but a very few exceptions, have been of average samples of full vertical sections of these out-crops, hence these coals, in the majority of the instances, doubtless, have been underestimated, for it is a well known fact, that all bituminous coals on weathering lose more or less in the proportional parts of their valuable constituents, volatile matter and fixed carbon, and gain in the percentages of their hurtful ingredients, moisture and ash. Much of this coal, however, stands weathering finely, for frequently around the old pits there are piles of lumpy coal that have been lying out in the weather for from thirty to forty years.

These old pits or surface diggings are principally along the banks and beds of the smaller streams and near the heads of the hollows and ravines, where the out-crops of coal are most frequently exposed and where sometimes, over considerable areas, the bedded rock covers have been removed by denudation and the coals are covered merely by loose materials which have been washed from the higher grounds. From such out-crops as these, for a great many years, up to the building of the Alabama Great Southern Railroad, Tuscaloosa was supplied with coal that was hauled in wagons from ten to twenty miles. Many flat boat loads of coal were also raised from these out-crops in *ante-railroad* times in Alabama and floated down the river, during high stages of the water, to Tuscaloosa and Mobile. As the bedded rock covers to the coals were reached in these surface diggings, the out-crops were deserted and new ones were sought, hence, in the localities of these out-crops most convenient to Tuscaloosa, there are old coal pits in almost every hollow and ravine. This hauling of coal to Tuscaloosa in wagons was a regular business with a good many of the settlers in the *piney woods*, and others made it convenient to carry a load of coal to get a little *cash* to buy sugar, coffee, etc., whenever they had to go to town. There was then, as now, some little mining of these coals at and near Tuscaloosa on more scientific principles than the above surface diggings, or by drifts and shafts, but it has never exceeded the local demand. Since the completion of the Alabama Great Southern Railroad, there have also been several small mines of drifts and shafts sunk on some of these coals near the railroad and the coals in them mined to a limited extent. A few years ago, a large body of these lands were bought up by the "Southern Mining and Transportation Company," and a wide gauge railroad, about four miles long, was graded and laid with cross-ties, and a slope and some half dozen drifts were sunk, and the company had gone to a very heavy expense in the fitting up of the mines, the building of houses, etc., etc., for the mining of coal on a very large scale, when suddenly, for some cause or other, it is said because of the death of the President of the Company, all work was suspended and things were left, as they are now, to go to waste.

As we believe that there crops out in this county all of the strata of the Coal Measures of the Warrior field, a general section of the out-crops of the strata of the Coal Measures of this county will be a general section of the strata of the Coal Measures of the Warrior field; and as we also now believe that our *General Section* of the strata of the Coal Measures of the Warrior field in Jefferson county, is wrong above (31), and that the strata of the Coal Measures below (31) are about the same in the two counties, we shall give here only that portion of the General Section of the Coal Measures of this county that is above (31) of the *General Section* under Jefferson county, and, for the rest of this section, we respectfully refer the reader to the part below (31) of the *General Section* under Jefferson county.

As these measures are complicated by folds, faults and in many other ways, and as our time and means have been limited and we have not been able to make any borings or diggings, but have had to judge solely by the out-crops, which are most frequently badly exposed, the following general section may be entirely wrong and we cannot claim for it more than an approximation, especially in the thickness of the thicker strata. We, however, do believe that the true number of coal seams in this county or in the Warrior field, with their thickness and relative positions, are closely given in the following general section :

A General Section of the Strata of the Coal Measures above Drainage Level in Tuscaloosa County.

	Sandstones, Shales; the sandstones are shabby and shaly, and the shales are clayey and bluish. At the least		60 ft. 0 in.
(53)	Coal; divided up by slate partings, contains about two feet of coal. Reported		3 ft. 6 in.
	Sandstones, Shales		15 ft to 20 ft. 0 in.
(52)	Coal		6 in.
	Conglomerates; in the river under the bridge at Tuscaloosa		10 ft. to 15 ft. 0 in.
(51)	Coal		8 in. to 0 ft. 10 in.
	Sandstones, Shales; the sandstones are massive, micaceous and carbonaceous and of a gray color		9 ft. to 15 ft. 0 in.
(50)	Coal; McLester (?), Prude	Double Seam, Dafford, Goree Beds and Mines, Maxwell, Eddins, Jemison, Peterson, Hamer, Burchfield No. 3.	1 ft. 1 in. to 1 ft. 8 in.
	Slate		2 in. to 10 ft. 0 in.
	Coal; middle group		2 in. to 2 ft. 0 in.
	Slate; hard		¼ in. to 0 ft. 2 in.
	Coal; lower group		4 in. to 1 ft. 3 in.
	Sandstones, Shales		10 ft. to 20 ft. 0 in.
(49)	Coal; Mallet, Garland Burchfield No. 2, etc.		1 ft. 6 in. to 2 ft. 6 in.
	Sandstones, Shales; about		25 ft. 0 in.
(48)	Coal; with slate partings. *Keene, Haldman, Burchfield No. 1*		8 ft. to 9 ft. 0 in.
	Fire Clay.		
	Conglomerates, *Sandstones*		25 ft. to 60 ft. 0 in.
(47)	Coal; Asylum (?), Factory, Cox, Ash, Manly, etc.		1 ft. 6 in. to 4 ft. 0 in.
	Sandstones, Shales		20 ft. to 30 ft. 0 in.
(46)	Coal		10 in.
	Sandstones, Shales		20 ft. 0 in.

(45)	COAL	1 ft. 7 in.	
	Sandstones, Shales; the sandstones are massive and slaty	20 ft. to 25 ft. 0 in.	
(44)	COAL	8 in. to 0 ft. 10 in.	
	Shales, Sandstones	10 ft. to 30 ft. 0 in.	
(43)	COAL; *University Seam*, from	2 ft. to 5 ft. 0 in.	
	Sandstones, Shales	15 ft. 0 in.	
(42)	COAL, *Slate*; in alternate streaks	1 ft. 4 in.	
	Sandstones, Shales	20 ft. to 25 ft. 0 in.	
(41)	COAL	9 in. to 1 ft. 3 in.	
	Sandstones, Shales; about	15 ft. 0 in.	
(40)	COAL	1 ft. 8 in. to 1 ft. 9 in.	
	Sandstones, Shales	25 ft. 0 in.	
(39)	COAL	5 in. to 1 ft. 6 in.	
	CONGLOMERATES	6 ft. 0 in.	
	Sandstones	10 ft. 0 in.	
	CONGLOMERATES	8 ft. 0 in.	
	Sandstones	10 ft. 0 in.	
(38)	COAL	1 ft. 2 in.	
	Fire Clay	5 in. to 5 ft. 0 in.	
	COAL	1 ft. 0 in.	
	Fire Clay; full of stem and leaf impressions	3 ft. 0 in.	
	Sandstones, Shales	8 ft. to 10 ft. 0 in.	
(37)	COAL	2 in. to 0 ft. 9 in.	
	Sandstones, Shales	30 ft. to 35 ft. 0 in.	
(36)	COAL	8 in.	
	Shales, Sandstones	80 ft. to 85 ft. 0 in.	
(35)	COAL; with a slate parting three inches thick	1 ft. 3 in.	
	Fire Clay; full of stem and leaf impressions	3 ft. 0 in.	
	Shales, Sandstones	40 ft. 0 in.	
(34)	COAL	1 ft. to 1 ft. 2 in.	
	Shales; about	40 ft. 0 in.	
(33)	COAL	2 ft. 6 in. to 3 ft. 6 in.	Supposed 6 ft. 8 in. to 11 ft. 8 in. *Pratt Seam.*
	Fire Clay	3 ft. 0 in.	
	Shale	0 to 4 ft. 0 in	
	COAL	10 in. to 1 ft. 2 in.	
	Fire Clay	2 ft. to 10 ft. 0 in.	
	Sandstones, Slates, Clays, with a streak of coal	20 ft. to 30 ft. 0 in.	
(32)	COAL; *fire clay seam*, good	1 ft. 4 in to 2 ft. 6 in.	
	Fire Clay	1 ft. to 1 ft. 6 in.	
	CONGLOMERATES, *Sandstones, Shales*	25 ft. to 40 ft 0 in.	
(31)	COAL	1 ft. to 2 ft. 0 in.	2 ft. 6 in to 17 ft. 6 in.
	Clay Slate	6 in. to 7 ft. 3 in.	
	COAL	1 ft. to 2 ft. 8 in.	
	Clay Slate	0 to 1 ft. 6 in.	
	COAL; good	0 to 3 ft. 6 in.	

The rest of this section is similar to *the part below (31) of the General Section under Jefferson County.*

DETAILS.

The Warrior River divides the Coal Measures of this county into two parts of about equal areas. A detail account of these measures can be given, perhaps just as well as in any other way, by considering these parts separately; we shall therefore take up first the eastern half or the part east of the river, and after we have finished with it we shall cross over the river and treat in like manner the western half or the part west of the river. In these details, we shall attempt to give the localities of all the known actual out-crops of coal, with, so far as we can, descriptions, sections and analyses of average samples of these full out-crops, and shall refer these out-crops to their respective positions or seams in the *General Section.* As these descriptions and sections are frequently of badly exposed out-crops, and as the analyses, with but a few exceptions, are of badly weathered samples, they all will have to be taken with a full degree of allowance, for they do not, by any means, represent the true values of the different coals, and often do them a great injustice.

The river in its winding course through the Coal Measures of this county, is about twenty-eight miles long and has a fall of between 95 feet and 100 feet; it is made up, from the alternation of thick beds of softer and harder strata, of a succession of long level reaches or deep pools which are separated by shoals or falls. The coal seams are mostly in the softer strata and hence their out-crops in the river are to be found principally in the deep pools or between the shoals.

We shall now commence our detail account of the eastern half of the Coal Measures of this county or of the part east of the Warrior River, and shall give our descriptions by starting with the strata which crop out along the county line on the north or the line between Tuscaloosa and Jefferson counties, and come south as we go to and fro, from east to west across the area in a zigzag fashion, taking up and discussing the coal out-crops, etc., seriatim or as we come to them. This county line between Tuscaloosa and Jefferson is said to be the *Taliaferro old trace* along the high divide between the waters of Valley, Mud and Big Shoal creeks on the north and those of Davis Creek on the south. In many places the exact location of this line is not known. The principal growth of this high divide is of the different kinds of oak, with some short and long leaf pine, chiefly in patches and strips, scattered among the oaks. The prevailing growths over our Coal Measures are very true indices of the nature and character of the soils and underlying strata, for it has been observed repeatedly that wherever the harder woods, or the oak, hickory, gum, etc., are in the ascendency, the soil has some clay in it and has been derived principally, from the weathering of shales, and, *vice versa*, wherever the chief growth is of the softer woods or pines, the soil is very siliceous and has come principally from the disintegration of sandstones and conglomerates.

Along Indian and White Oak creeks and the high divide between them, there are to be found out-crops of the coals from (31) to (43) inclusive of the *General Section*. A section has already been given, under Jefferson county, of the out-cropping of (33) of the *General Section*, on Lick Branch, a tributary of Indian Creek. From 275 feet to 300 feet above this coal out-cropping, there is in Farley's spring, in the S. E. ¼ of N. W. ¼ of S. 36, T. 18, R. 8 W., an out-cropping, twelve inches thick, of the coal (41) of the *General Section*. About 225 feet below this spring, there is on a branch of White Oak Creek, in the S. E. ¼ of S. 36, T. 18, R. 8 W., an out-cropping of a seam of coal about as follows:

Out-Cropping on a Branch of White Oak Creek,
in the S. E. ¼ of S. 36, T. 18, R. 8 W.

		(1)	(2)
(11)	*Slate*; sandy fossiliferous.	1 ft. 0 in.	4 ft. 0 in.
(10)	COAL	1 in.	COAL 5½ in.
(9)	*Slate*	¼ in.	
(8)	COAL	4 in.	

(7)	*Clay Parting*	streak.	½ in.
(6)	Coal	4 in.	4 in.
(5)	*Slate*	¼ in.	*Slate.* 3½ in.
(4)	Coal	1 in.	
(3)	*Slate*	2 in.	
(2)	Coal	1½ in.	1 in.
(1)	*Slate*; bluish, undrbed	6 in.	2 in.

No 1 occurs in the Geological Report for 1879-1880. These out-crops are most probably of (34) of the *General Section.* About forty feet below this last coal out-cropping, there is in the bed of White Oak Creek, in Mr. Farley's field, in the N. W. ¼ of S. E. ¼ of S. 2. T. 19, R. 8 W., a showing of coal in two places, each of which is said to be about eight inches thick. They are likely of the bottom seam of (33) of the *General Section.* Lower down White Oak Creek, about one mile, in the north-east corner of S. 10, T. 19, R. 8 W., there is a reported out-cropping of coal two feet in thickness. It is over a conglomerate rock, and is doubtless of (32) of the *General Section.* The rocks along the bed of White Oak Creek are in waves from north-east to south-west. Some 220 feet above this last out-cropping of coal, there is an appearance of coal under a bluff of massive sandstones, in the S. W. ¼ of S. 3, T. 19, R. 8 W., which is probably of the seam (36) of the *General Section.* In White Oak Creek about 150 yards from its mouth or in the S. E. ¼ of N. W. ¼ of S. 10, T. 19, R. 8 W., there is an out-cropping of coal of (30) or (31) of the *General Section,* about as follows ;

Out-Cropping at the Mouth of White Oak Creek, in the S. E. ¼ of N. W. ¼ of S. 10, T. 19, R. 8 W.

(10)	*Sandstones;* slabby and massive, bluffy.	
(9)	*Slate;* gritty and hard	2 ft. 6 in.
(8)	Coal	3 in.
(7)	*Slate*; bluish	⅛ in.
(6)	Coal	1 in.
(5)	*Slate*; black and bituminous	2 in.
(4)	Coal; with one-eighth inch parting of grayish slate	1 in.
(3)	*Slate*; bluish	1 ft. 6 in.
(2)	*Debris*	10 ft. 0 in.
(1)	*Sandstones*; massive, must be the rocks which form Fair Shoals.	

Here at the mouth of White Oak Creek, the rocks have a dip of 8° to 10° to the south-west. The divide between White Oak Creek and the river along Squaw Shoals, is over 400 feet high and is capped, to a thickness of forty to fifty feet, with rounded flint pebbles of the Drift. The Squaw Shoals are the greatest falls on the Warrior River; they are between four and five miles long and have a fall of over forty feet; they are formed of the hard massive sandstones, which are conglomerates in certain localities, between (29) and (30) of the *General Section.* In the river just below Squaw Shoals, there is said to be an out-cropping of coal, it is doubtless of (30) of the *General Section.* There is also reported coal in Squaw Shoals, it is likely of (29) of the *General Section.*

The bed of Lick Branch near Mr. Bob Patton's, in the S. W. ¼ of S. E. ¼ of S. 19, T. 18, R. 7 W., is made up of broad and flat thick flagstones, which are cut up by parallel perpendicular planes of division, from two to four feet apart, running north-east and south-west. There is said to be here in the creek near Mr. Patton's a seam of coal; it is likely over the above flagstones and is most probably (34) of the *General Section.* Along the road and the county line on the high divide north and east of the head waters of White Oak Creek, there are to be seen several imperfect out-croppings of coal; they are believed to be of the seams from (36) to (43), inclusive, of the *General Section.*

On the side of the hill east of Mr. Bob Patton's and some 175 feet above the coal near his house, there is a thin showing of coal smut in the road, which is likely of the seam (36) of the *General Section,* and in the Patton's Ferry road in the northern part of S. 5, T. 19, R. 7 W., there is an out-cropping of coal smut about twelve inches thick, with an under-bed of fire clay. This last coal is doubtless of (40) or (41) of the *General Section.*

In the back part of a rock-house, under "Big Coal Bed Branch" as it pours over an over-hanging crescent shape bluff, in the S. E. ¼ of S. E. ¼ of S. 7, T. 19, R. 7 W., there is an out-cropping of (38) of the *General Section.* At this out-cropping there is the following section:

Section on "Big Coal Bed Branch," in the S. E. ¼ of S. E. ¼ of S. 7, T. 20, R. 7 W.

(9) *Debris*; soil	4 ft. 0 in.
(8) *Conglomerate*; full of pebbles	6 ft. 0 in.
(7) *Sandstones*; slabby and massive	11 ft. 0 in.
(6) *Conglomerate*; a mere mass of flinty and cherty looking pebbles, of light and black colors, in a matrix containing much *ferric oxide*	8 ft. 0 in.
(5) *Sandstones*; of a slaty color	10 ft. 0 in.
(4) COAL; with partings of thin sheets of slate, three to four inches apart, along which the coal easily divides	1 ft. 3 in.
(3) *Fire Clay*; full of leaf impressions	5 in.
(2) COAL; with, in places, thin slaty partings near the center	2½ in.
(1) *Fire Clay*; full of the stem and leaf impressions of coal plants	3 ft. 0 in.

This seam of coal also crops out in Mr. B. E. Thompson's spring, in the N. E. ¼ of N. W. ¼ of S. 17, T. 19, R. 7 W., where it is some twelve to fifteen feet higher than that of the above section, hence the dip is considerable and is to the north-west. About 150 feet below this coal out-cropping in Mr. B. E. Thompson's spring, there is in the northern bank of Davis' Creek, at Mr. Thompson's mill or Hayes P. O., in the S. W. ¼ of S. E. ¼ of S. 17, T. 20, R. 7 W., the following section:

Section at Hayes' Post Office, in S. W. ¼ of S. E. ¼ of S. 17, T. 20, R. 7 W.

(7) *Debris.*	
(6) *Sandstone*; massive	40 ft. 0 in.
(5) COAL; with, in places, thin sheets of slate, from two to four inches apart, along which the coal easily separates	1 ft. 0 in.
(4) *Slate*; hard, sandy and ferruginous	2 in.
(3) COAL	3 in.
(2) *Fire Clay*; full of stem and leaf impressions	3 ft. 0 in.
(1) *Sandstones*; to low water level	15 ft. 0 in.

This coal out-cropping is very similar to that of the preceding section on "Big Coal Bed Branch," but its cover is entirely different. It is of (35) of the *General Section.* The dip at this out-cropping is seemingly to the NEN., though but a short ways down the creek or to the north-west, there is coal in the bed of the creek, which is believed to be of this same seam. On the opposite or south side of the creek from this coal out-cropping, the smut of this same seam shows in an embankment that has been cut down.

On the high divide about two miles NEN. of Hayes' P. O. or in the S. W. ¼ of N. E. ¼ of S. 9, T. 19, R. 7 W., there is an out-cropping of coal smut from twelve to fourteen inches thick with a parting of clay or clay slate, near the center, about four inches thick. This out-cropping is most likely of (39) of the *General Section.* Some five to six feet under this coal smut, there sets in a thick bed of coarse red sandstone. The limits of the out-crops of this coarse sandstone, on this divide, could almost be marked out by the growth of long leaf pine that covers them. Under this massive sandstone, which is doubtless a conglomerate and contains pebbles in its lower part, there is in the road on the west side of Rock House Creek and some 160 feet above the creek in the S. *W.* ¼ of S. W. ¼ of S. 16, T. 19, R. 7 W., a showing of about two inches of coal smut with a clay underbed. This smut is most probably of (37) of the *General Section.* On top of the high divide, in the road in the south-west corner of S. 3, T. 19, R. 7 W., there is a very imperfect out-cropping of a thick seam of coal with slate partings, which is probably of the same seam as the *University seam* or (43) of the *General Section.*

Under the two inches of coal smut, (37) of the *General Section,* above spoken of as being under the massive coarse sandstone, there is a thick bed of shales whose out-crops on the opposite or east side of Rock House Creek form a strip of country that is known as the *oak flats,* from the fact that most of the growth over them is of the different kinds of oak. This oak growth is in quite a contrast to that of the pine on the opposite or west side of Rock House Creek, over the out-crops of the massive sandstone.

In the old Wild Cat Road, in the N. W. ¼ of S. E. ¼ of S. 22, T. 19, R. 7 W., there is an out-cropping of coal about twelve inches thick with an underbed of fire clay about two feet thick. A little farther down the road, on the opposite side of a hill and some forty feet lower, is an other coal outcropping. These coals are of (35) and (34) of the *General Section.* About on the line between S's 22 and 27, T. 19, R. 7 W., there is a mountain in the shape of a potatoe hill, which is over 300 feet above the surrounding country and over 400 feet above Rock House Creek, just to the west of it. This mountain is the loftiest point in Tuscaloosa county. There is a thick growth and undergrowth, principally of the different kinds of oak, over the sides and top of this mountain, and there are no visible out-crops of bedded rocks on it. Over the top and for some forty feet down the sides from the top are some loose pieces of ferruginous conglomerates, with rounded flint pebbles, seemingly of Drift origin, though they may be of the conglomerates between (38) and (39) of the *General Section.* Lower down the Wild Cat Road, in the S. E. ¼ of S. 34, T. 19, R. 7 W., there are several out-croppings of coal smut from four to five inches thick; they are doubtless all of the same seam which is likely (36) of the *General Section.*

On the side of a hill in the N. E. ¼ of S. 26, T. 19, R. 7 W., there is the following badly exposed out-crop:

Out-Cropping in the N. E. ¼ of S. 25, T. 19, R. 7 W.

(7)	*Sandstones;* massive, doubtless a conglomerate.	
(6)	*Debris*	2 ft. 6 in.
(5)	COAL SMUT; visible	1 ft. 2 in.
(4)	*Fire Clay, Debris*	5 ft. 0 in.
(3)	COAL SMUT; visible	1 ft. 0 in.
(2)	*Debris*	4 ft. 0 in.
(1)	COAL SMUT; visible	4 in.

This out-crop is likely of (38) of the *General Section.*

In the road and on the side of a hill about one mile east of the last out-cropping, and about 100 feet lower, there is the following out-crop:

Out-Cropping in the N. W. ¼ of N. W. ¼ of S. 31, T. 19, R. 6 W.

(5)	*Shale.*	
(4)	COAL SMUT	2 ft. 6 in.
(3)	*Clay, Debris*; about	4 ft. 0 in.
(2)	COAL SMUT; visible	1 ft. 2 in.
(1)	*Fire Clay;* underbed.	

This out-cropping is doubtless of (33) of the *General Section.*

The dip of these out-crops is 8° to 10° to the north-west.

At Liberty Church Spring, in the S. E. ¼ of S. E. ¼ of S. 31, T. 19, R. 6 W., there is an out-cropping of coal ten inches thick, and in the Birmingham road in the S. W. ¼ of S. W. ¼ of S. 31, T. 19, R. 6 W., are three out-croppings of coal smut, each of a few inches in thickness. The upper smut in the road is likely of the same coal as crops out at Liberty Church Spring. Some sixty feet lower than this coal out-cropping at the spring, there is, in the N. W. ¼ of N. W. ¼ of S. 5, T. 20, R. 6 W., an old pit on the out-cropping of a seam of coal, which is said to be two feet six inches thick. In the same *forty* as this pit, some 150 yards south-east of it, there is in a ditch an out-cropping of coal about eighteen inches thick with a slate parting. It is probably of the same seam as that in the pit. Some thirty-five to forty feet lower than this coal in the ditch, there is in a gully, in the S. W. ¼ of S. 5, T. 20, R. 6 W., an out-cropping of coal about fourteen inches thick with a slate parting and a fire clay underbed. In the bed of a branch some 300 yards south-east of the above coal in the gully, and eighteen to twenty feet below it, there is the out-cropping of an other seam of coal. Between these last two coals are some massive sandstones. These coal out-croppings near Liberty Church have a dip of 8° to 10° to the north-west and are of some of the seams from (28) to (31), inclusive, of the *General Section.*

In a branch in the S. W. ¼ of S. W. ¼ of S. 8, T. 20, R. 6 W., there are out-crops about 150 feet apart of two seams of coal, which have been surface dug some. The coal of the lower of these seams was visible to a thickness of about eighteen inches. They have a dip of about 25° to the north-west, and are most probably of the two seams (21) and (22) of the *General Section.* About fifty yards and 125 yards SES. of the out-cropping in the branch, there are other pits on the out-cropping of the lower of these seams, in which the coal smut showed to a thickness of about two feet six inches. The coal of this lower seam on weathering breaks up into long splinters. These coal out-crops are just to the north-west of the fault which is seen to cross the road in the N. W. ¼ of S. W. ¼ of S. 4, T, 20, R. 6 W., and which separates the *big* and *little basins.* The fault as it crosses the above road runs about S. 10° W. or N. 10° E.

East of the last mentioned coal pits about one-fourth of a mile and three-fourths of a mile are other out-croppings of coal. In these most easterly out-croppings, there are two seams of coal or two benches of the same seam, which are about ten feet apart. In the upper of these benches, the coal smut was visible to a thickness of about eighteen inches. These two coal benches are believed to be of the thick seam (21) of the *General Section,* in its out-crops on the south-east or *little basin* side of the above fault, or on the opposite side of the fault from the out-croppings in the S. W. ¼ of S. W. ¼ of S. 8, T. 20, R. 6 W.

Col. Giles Edwards gave the following as a section of out-crops in the north-east corner of T. 19, R. 7 W.; he is mistaken in both the township and range, and doubtless meant out-crops in the north-west corner of T. 20, R. 6 W.

Section of Out-Croppings in the N. W. Corner T. 20, R. 6 W.

(4)	COAL	2 ft. 10 in.
	BLACK BAND	1 ft. 4 in.
	Fire Clay	1 ft. 10 in.
	Measures	75 ft. 0 in.
(3)	COAL	9 in.
	Slate	3 in.
	COAL	3 ft. 5 in.
	Slate	½ in.
	COAL	1 ft. 4 in.
	Measures	40 ft. 0 in.

(2)	**Coal**	6 in.
	Slate	2½ in.
	Coal	3 ft. 6 in.
	Slate	streak.
	Coal	1 ft. 4 in.
	Slate	streak.
	Coal	3 ft. 1 in.
	Fire Clay	1 ft. 7 in.
	Coal	9 in.
	Measures; nearly	200 ft. 0 in.
(1)	**Coal**	2½ in.
	Slate	2 in.
	Coal	4 in.
	Slate	streak.
	Coal	2 ft. 5 in.
	Slate	streak.
	Coal	2 ft. 2 in.

Nos. (1), (2), (3) and (4) of the above section are doubtless respectively of the seams (18), (21, (22) and (24) of the *General Section.* The measures between (3) and (4) of this section more than likely contain the coal seam (23) of the *General Section,* while the measures between (1) and (2) of the above section most probably contain the coals (19) and (20) of the *General Section.*

In the N. W. ¼ of N. E. ¼ of S. 11, T. 20, R. 6 W., there is a coal out-cropping which has furnished the neighborhood black-smiths with considerable coal; it is partly covered by water but was felt down to a thickness of about twenty inches, without being able to reach its bottom. In a pit in the N. E. ¼ of S. E. ¼ of S. 11, T. 20, R. 6 W., there is the following out-crop :

Out-Cropping in the N. E. ¼ of S. E. ¼ S. 11, T. 20, R. 6 W.

(7)	***Shale.***	
(6)	**Coal**	5 in.
(5)	***Clay Slate***	2 in.
(4)	**Coal**	1 ft. 6 in.
(3)	***Slate;*** clayey	1½ in.
(2)	**Coal**	10 in.
(1)	***Slate, Debris.***	

This out-cropping has a dip of about 20° to the north-west and is between the crest of the anticlinal fold and the fault along the north-east edge of the *little basin.*

In the south-west half or the part of the *little basin* that is within this county, the visible out-crops of coal are not near so numerous as they are in the north-east half or the part within the county of Jefferson. Near the lowest portion of this *little basin* or the central longitudinal line, close to Mr. J. T. Willard's or the half-mile stake on the line between S's 14 and 15, T. 20, R. 6 W., there is an out-cropping, about one and a-half inches thick, of coal smut in the road. It is doubtless of (25) of the *General Section*. It has a dip of 6° to 8° to the north-west. On the south-east side of the *little basin*, near Mr. H. B. Norwood's or near the center of S. 26, T. 20, R. 3 W., there are some old coal pits in the out-croppings of a seam of coal which is said to consist of three benches, each of about eighteen inches in thickness; they are separated by partings of slate. The slate parting between the lower two benches is reported to be twelve inches thick and that between the upper two benches, three inches thick. This out-cropping is probably of (21) of the *General Section*, though it may be of a lower seam. Some 600 yards west of these old pits, there is, in the road, an out-cropping of coal which forms the crest of an anticlinal fold or which has a dip of about 45° to the south-east and a dip of about 25° to the north-west. This is the only place in which we have seen, on the south-east side of the *little basin*, a fold away from the edge of the anticlinal valley, though we have in many places suspected on this side of the *little basin* the presence of a *closed-fold*, which had been so pushed over until all of its strata had a dip in the same direction, to the north-west, and which, together with a fault, had hid the *upper conglomerate* at the base of the measures, and other strata.

South-west of the above old pits about one-quarter of a mile, or in the S. W. ¼ of S. 26, T. 20, R. 3 W., there is in the public road an out-cropping of coal which may be of the same seam as the one at the old pits. This out-cropping has a dip of about 45° to the north-west. South-east of it, though in the same *forty*, there is in a branch an out-cropping of coal which is pronounced to be two feet in thickness. It is of a lower seam than any of the above out-croppings and may be of (14) of the *General Section*. At this out-cropping, the dip is to the south-east, showing the presence of a fold or fault, or both.

Along the top of Rock Mountain south of the Bucksville road, the conglomerate or millstone grit is very massive and coarse grained, though it has in it but few large pebbles. It is usually of a light color and is commonly soft before exposed. In many of these conglomerates, there are pot holes several feet in diameter, which were once filled with concentric rings or shells of softer material or were once concretionary knots in the massive conglomerates. In the out-crops along the top of this south-east end of Rock Mountain, some of these conglomerates are about perpendicular while others have a dip of only about 30° to the north-west. In this neighborhood or north of the crossing of the Bucksville road, there have been seen, between this millstone grit and the Knox Dolomite of the anticlinal valley, *Sub-carboniferous*, *Black Shale* and *Clinton* rocks, hence the fault, or vertical displacement of the strata in the fault here along the south-east edge of Rock Mountain, must not be so great as it is at points north-east and south-west of here, where the Millstone Grit and Knox Dolomite join hand and hand or have no intermediate strata between them.

About two miles south-west of the crossing of the Bucksville road, Rock Mountain, as a well defined or rather continuous ridge, dies out for good, though the Millstone Grit forms a considerable ridge and occurs as high bluffs several miles farther to the south-west, or near Vance's Station on the Alabama Great Southern Railroad, on a line of the same general direction as Rock Mountain. This Millstone Grit has been seen, by the State Geologist, as far to the south-west as S. 3, T. 24 N., R. 7 W. For several miles to the south-west of the above south-west end of Rock Mountain, or to the north-east of Vance's Station, the millstone grit lies almost level or is almost flat and forms glady places or *rocky plaines* instead of mountains.

With the disappearance of Rock Mountain or the elevated south-east rim and the flattening of the strata along the south-east edge of the measures, there of necessity comes an end to the *little basin* as such or as a trough. This south-west end of the *little basin* has no cavity in it like the north-east end but appears to run out to a rounded point

Near Mr. Wilson Strickland's in the south-west or perhaps just south-west of the south-west end of the *little basin*, in the N. W. ¼ of S. E. ¼ of S. 31, T. 20, R. 6 W., there are several out-croppings of a thick seam of coal which, in one place, shows as follows:

Out-Cropping near Mr. Wilson Strickland's, or in the N. W. ¼ of S. E. ¼ of S. 31, *T.* 20, *R.* 6 *W.*

(6) *Debris, Soil.*	
(5) COAL	1 ft. 2 in.
(4) MOTHER OF COAL	3 in.
(3) COAL	1 ft. 2 in.
(2) *Slate*	2 in.
(1) COAL; has been dug into, without getting through it, to a depth of at least	1 ft 0 in.

These out-croppings are most probably of (21) of the *General Section.*

There are also out-crops of coal in the N. E. ¼ of N. W. ¼ of S. 36, T. 20, R. 7 W. and in the S. E. ¼ of S. 20, T. 20, R. 6 W.

Near the north-east corner S. 32, T. 20, R. 6 W., there is an out-cropping of coal, high up on the side of a ridge, which is believed to be of a thin seam, perhaps (23) of the *General Section.* On the top of a high ridge, near the north-west edge of the *little basin*, in the N. E. ¼ of N. W. ¼ of S. 29, T. 20, R. 6 W., there are several pits into an out-cropping of coal, which has about the following section:

Out-Cropping in the N. E. ¼ of N. W. ¼ of S. 29, *T.* 20, *R.* 6 *W.*

(5) *Debris, Soil.*	
(4) COAL SMUT	2 ft. 5 in.
(3) *Clay, Slate*	1 ft. 1 in.
(2) COAL SMUT	6 in.
(1) *Soil.*	

The dip of this out-crop is about 65° to the north-west; it is believed to be of (22) of the *General Section.*

North-west of this last out-cropping about one-fourth of a mile, between it and the fault along the north-west edge of the little basin, at a crossing of the northern prong of Davis Creek, the strata have a dip of about 80° to the north-west. In the north-east bank of Davis' Creek, some half mile below the fork, or in the S. W. ¼ of S. E. ¼ of S. 18, T. 20, R. 6 W., there is the following out-cropping, it is believed, of the *Cal. Williams, Corona, etc.. coal seam* or (28) of the *General Section*, in what is known as the *Kennedy Bed*:

Out-Cropping at the "Kennedy Bed,"
in the S. W. ¼ of S. E. ¼ of S. 18, 20, *R.* 6 *W.*

Debris.			
Sandstones; light gray color, micaceous	3 ft. 6 in.		
Slate; clayey, fossiliferous, about	1 ft. 9 in.		
Coal	5 in.	*Upper Group.*	3 ft. 10¼ in.
Slate; bluish	1½ in.		
Coal	8 in.		
Slate; bluish	6½ in.		
Coal	2 in.		
Slate; bluish, about.	6½ in.		
Coal	3 in.		
Slate; bluish	1 in.		
Coal	1 in.		
Slate	½ in.		
Coal	¼ in.		
Slate; bluish	2 in.		
Coal	6 in.		
Slate; bluish	2½ in.		
Coal; slaty	½ in.		
Shale; gritty, fossiliferous, massive, likely a sandstone in places. About	4 ft. 3 in.		
Coal	3 in.	*Lower Group.*	7 ft. 9¾ in.
Slate; bluish, about	1½ in.		
Coal; slaty, rusty	6 in.		
Slate	¼ in.		
Coal	1 in.		
Slate; about	1 in.		
Coal	2 in.		
Slate	½ in.		
Coal; with streaks of slate in places (c)	1 ft. 8 in.		
Slate; clayey, *soap-stone*, about	5½ in.		
Coal; in blocks, rusty, contains thin sheets of slate	5 in.		
Black Slate, Mother of Coal	1 in.		
Coal; (b)	2 ft. 6 in.		
Slate; bluish	4 in.		
Coal; (a)	1 ft. 1 in		
Slate, Debris; to level of low water	3 ft. 0 in.		

The coal of the middle and main seam, (b), of the *lower group* of the above section is hard and seemingly very pure and bituminous, and is of a glistening black color. It is granular, but does not break into regular pieces. The coal of the upper seam, (c), of this *lower group* is somewhat similar to that of (b), though it is not quite so black and bituminous. The rest of the coals of this out-crop break up into cubical blocks, which are dryer and do not smut so badly and are not so black and bituminous as are the coals of (b) and (c). This out-crop has a dip of 15° to 20° to the north-west.

Up the creek and in the creek south-east of the above out-cropping about one-fourth of a mile, there is said to be an out-cropping of a thick seam of coal from which lumps of coal the size of barrels have been thrown up by the water. It is of a seam which must be under the *Kennedy Bed*, and is very probably of (26) of the *General Section.* The measures of this immediate neighborhood have been very much disturbed; they have not only suffered a great vertical displacement along the main fault between the *little* and *big basins*, but have been complicated also by folds and, it is believed, by other faults.

On the side of a branch in the S. W. ¼ of N. E. ¼ of S. 19, T. 20, R. 6 W., and on the opposite or *big basin* side of the fault between the basins from the *Kennedy Bed*, there is the following out-crop:

Out-Cropping in the S. W. ¼ of N. E. ¼ of S. 19, T. 20. R. 6 W.

(11)	*Sandstones*; micaceous and of a dull ashy gray color, showing about	4 ft. 6 in.
(10)	*Debris, Soil*; may hide some coal	25 ft. 0 in.
(9)	COAL SMUT	1 ft. 7 in.
(8)	*Slate*; clayey	4 in.
(7)	COAL SMUT	1 in.
(6)	*Slate*; clayey	2 ft. 3 in.
(5)	COAL SMUT	6½ in.
(4)	*Fire Clay*	11½ in.
(3)	COAL SMUT	15½ in.
(2)	*Fire Clay;* visible	1 ft. 0 in.
(1)	Debris, Sandstone, Shale; the debris just under the above out-cropping of coal may cover a part of the seam.	

The above out-cropping is more than perpendicular or has been so pushed over until its bottom is on top or its dip is reversed to some 75° or 80° to the south-east. Its strike is about S. 40° W. It is most likely of (22) of the *General Section.*

Col. Giles Edwards says that near this last out-cropping that there is the following splendid showing of coal, which we believe is of a seam that is under that of the last out-cropping or is of the thick seam (21) of the *General Section*:

Out-Cropping of Coal in the S. W. ¼ of N. E. ¼ of S. 19, *T.* 20, *R.* 6 *W.*

(11)	COAL	1 ft. 9 in.
(10)	*Parting*	streak.
(9)	COAL	1 ft. 0 in.
(8)	*Parting*	streak.
(7)	COAL	3 ft. 0 in.
(6)	*Parting*	2½ in.
(5)	COAL	2 ft. 0 in.
(4)	*Parting*	streak.
(3)	COAL	1 ft. 8 in.
(2)	*Parting*	streak.
(1)	COAL	1 ft. 0 in.

The above out-cropping or section shows less interstratified slate for the thickness of the coal than any we have seen in the Warrior Coal Field.

Near these last two out-croppings, there is an other of the following section, which is doubtless of the same seam as one or the other of the above out-crops:

Out-Cropping of Coal in the S. W. ¼ of N. E. ¼ of S. 19, *T.* 20, *R.* 6 *W.*

(5)	COAL	1 ft. 6 in.
(4)	*Slate*	2 ft. 0 in.
(3)	COAL	1 ft. 6 in.
(2)	*Slate*	1 ft. 0 in.
(1)	COAL	8. in.

On the side of the hill, east of Patterson Creek, in the S. E. ¼ of N. W. ¼ of S. 19, T. 20, R. 6 W., there is an out-cropping of coal, about two feet in thickness, which dips about 85° to the north-west. Some 200 yards down the creek or to the NWN. from this coal out-cropping, at the old fish trap, the rocks dip about 80° to the north-west and have a strike of about N. 25° E. In the south-east corner of S. 13, T. 20, R. 7 W., there is an out-cropping from which much coal has been raised. It has a dip of 40° to 50° to the north-west. Some fifty to sixty feet below this out-cropping, there is on the side of a branch and the Oaky Hollow road, near Mr. Norwood's, in the north-east corner of S. 13, T. 20, R. 6 W., an out-cropping of coal, about twelve inches thick, which breaks out in long blocks. Down the branch and across the field, about two hundred yards north-east of this last coal out-cropping and some twenty-five to thirty feet lower, there is an other coal out-cropping, seemingly between sandstones. Some 175 feet above this out-cropping, there is on a branch, in the N. E. ¼ of N. E. ¼ of S. 23, T. 20, R. 6 W., the following out-cropping :

Out-Cropping in the N. E. ¼ of N. F. ¼ of S. 23, T. 20, R. 6 W.

(4)	*Debris.*	
(3)	COAL	1 ft. 5 in.
(2)	*Slate*	1 in.
(1)	COAL; visible to a thickness of	6 in.

Nearly 100 feet lower than this coal, there is in the Oaky Hollow road in the N. E. ¼ of N. E. ¼ of S. 23, T. 20, R. 6 W., an out-cropping of coal, from eight to ten inches thick under and over clay or clay slate. Farther down the road, to the south some 100 yards, and on twelve to fifteen feet higher ground, there is an out-cropping of coal visible to a thickness of five to six inches and covered by clay. Still farther down the road, to the south some one-half mile and twenty-five to thirty feet higher, there is, at the twenty mile post from Tuscaloosa, an other out-cropping of coal, in which the smut is visible to a thickness of about twelve inches, though there is believed to be more coal both above and below this smut. The above out-croppings of coal in S's 13 and 23, T. 20, R. 7 W. are likely of the seams from (36) to (33), inclusive, of the *General Section.*

Just below the spring at the Sam Hosmer's old place in the N. E. ¼ of S 22, T. 20, R. 7 W., there is an out-cropping of coal which is reported to be about thirty inches thick. The spring runs from under a bluff of ferruginous conglomerates or a mere mass of rounded flint pebbles held together by ferric oxide. These conglomerates look very much like they were of the Drift, but they are believed to be of the conglomerates between (38) and (39) of the *General Section.* The conglomerates here above the spring show to a thickness of only about ten feet, though they are believed to form most of the height to the level of the country above, which is about forty feet. At or near this spring and in or under these conglomerates, the *mineral rod men* have located a *silver mine,* and, as proof of their convictions, have done much hard work. They at first commenced at the spring and drifted under the couglomerates but on the crushing or killing of one of their number by the falling of the conglomerates, they abandoned this drift and sank a shaft down through the conglomerate from the top of the hill above the spring. As to whether they ever found any silver, can be readily imagined. The largest growth of this vicinity is long leaf pine, and hence the soil is very siliceous and if not of Drift origin, is more than likely derived from the desintegration of sandstones and conglomerates.

In the N. W. ¼ of N. W. ¼ of S. 21, T. 20, R. 7 W., there is an out-cropping of coal which is said to be about thirty inches thick and east of it, some 150 yards, and thirty feet lower, there is an other out-cropping, which is believed to be of a thick seam. The coal of this last out-cropping has some slate partings and between the two coal out-croppings there are some massive sandstones. These out-crops are most probably of (50) and the *upper group* of (50) of the *General Section,* as shown in the *Pitcher and Jones beds.*

On Hosmer Creek in the S. W. ¼ of N. E. ¼ of S. 10, T. 20, R. 7 W., there is an out-cropping of coal that is supposed to be about two feet thick, though it showed to a thickness of only about eight inches. The strata near this out-cropping have a dip of 15° to 20° to the north-west, hence they must be of a fold. This last out-cropping of coal is probably of (20) of the *General Section.*

In the old Wild Cat road in the N. W. ¼ of N. E. ¼ of S. 10, T. 20, R. 7 W., there is an out-cropping of about twelve inches of coal smut which has a dip of 3° to 1° to the north-west. The shales over this coal seem to form all the strata up to near the top of "Martha Washington Mountain" or for some 250 feet or more. In the road on the opposite side of a hill from this last out-cropping and some twenty feet lower, there is a showing of a seam of coal with a fire clay underbed and massive sandstones eight to ten feet above it. These two coal out-croppings are believed to be of (31) and (32) of the *General Section.* The rocks along Hosmer Creek at the ford of the Wild Cat road or at W. Thompson's Mill, have in them false beddings. Still farther north, in the Wild Cat road between Hosmer and Davis creeks or in the S. W. ¼ of S. W. ¼ of S. 2, T. 20, R. 7 W., and some thirty feet higher than the last out-cropping of coal, there is a showing of about fifteen inches of coal smut with shale both above and below it. It is probably of (32) of the *General Section.*

In the S. E. ¼ of S. W. ¼ of S. 8, T. 20, R. 7 W., there is over an underbed of fire clay an out-cropping of coal which is said to be about four feet thick. It is likely (48) of the *General Section.* West of this out-cropping about one-quarter of a mile, there is another appearance of coal which is doubtless of the same seam. In this last out-cropping, the coal was dug down into about three feet without getting through it; the water ran into the hole so rapidly that the digging had to be stopped. In the N. E. corner of S. 7, T. 20, R. 7 W., there is an out-cropping of this same seam, (48) of the *General Section,* in what is known as the *Burchfield Bed No.* 1; it shows about as follows:

Out-Cropping of Burchfield Bed No. 1,
in the N. E. corner of S. 7, *T.* 20, *R.* 7 *W.*

	(1)	(2)
(12) *Shale;* curly, visible.		
(11) COAL; badly weathered, cubical, slaty	4 in.	COAL; 13 in.
(10) *Slate;*	½ in.	
(9) COAL; hard and cubical	8½ in.	
(8) *Slate;* with streaks of *coal*	3 in.	3 in.
(7) COAL	9 in.	9 in.

(6)	*Slate;* with streaks of *coal*	2 in.	2 in.
(5)	Coal	9 in.	7½ in.
(4)	*Slate*; with streaks of *coal*	1¼ in.	2½ in.
(3)	Coal; soft	14½ in.	15 in.
(2)	*Fire Clay*; parting	20 in.	22 in.
(1)	Coal; visible 20 in., reported	30 in.	19 in.

Section (2) is taken from the Geological Report for 1879-1880, and is said to be of an out-cropping in the N. E. corner of S. 9, T. 20, R. 7 W., though it is doubtless of the same out-cropping as *Section* (1), in the N. E. corner of S. 7, T. 20, R. 7 W.

Thirty and forty years ago a great deal of coal was raised from this out-cropping and hauled in wagons to Tuscaloosa. The dip is seemingly to the SWS.

In a deep ravine in the S. E. ¼ of S. W. ¼ of S. 5, T. 20, R. 7 W., and on some forty to fifty feet lower ground than the *Burchfield bed No.* 1, there is an out-cropping of coal, visible to a thickness of eight inches, with a parting of slate. This coal is probably of the seam (46) of the *General Section.* Below the mouth of this ravine or near the centre of S. 5 T. 20, R. 7 W., a fault, running NWN. and SES., crosses Burnside Creek. The south-west side of this fault is of a *down-throw* or the north-east side is of an upheaval. At this fault, on the south-east side of it, there is an out-cropping of coal about thirteen inches thick, with a slate above and below it. Immediately along the line of this fault, the rocks are about perpendicular and are very much broken up, though a few feet from it, on each side, they appear to be undisturbed and to have a dip of only 2° to 3° to the south-west. The displacement along this fault is not believed to be more than sixty to seventy feet. This fault was also seen about three-fourths of a mile NWN. of the above locality, as it crosses "Turkey Leg Branch" near the half-mile line in the southern part of S. 32, T. 19, R. 7 W. At this point the strata on each side of and next to the perpendicular rocks, have a dip seemingly of 10° to 12° to the north-east, though they are of somewhat different rocks.

Down Burnside Creek from the above fault, where first seen, or north-east of that point about 150 yards, there is a coal out-cropping aboutt welve inches thick. It has a dip of 10° to 15° to the ESE. Still farther down this creek, to the NEN. about one-fourth of a mile, there is said to be an out-cropping of coal between gritty shales, which must be considerably below this last one, ten feet or more. These out-croppings of coal on Burnside Creek are likely of (44) and (43) of the *General Section.*

Near the half-mile stake on the line between S's 32 and 5, of T's 19 and 20, R. 7 W., there is on a branch, an out-cropping about twelve inches thick of a seam of coal with slate partings. Down the branch or NWN. of this coal, about 100 yards and some ten feet lower, there is the following out-cropping:

Out-Cropping near the S. E. corner of the S. W. ¼ of S. 32, *T.* 29, *R.* 7 *W.*

(5)	*Debris*; with smut in places, doubtless covering some coal.	
(4)	Coal Smut	7 in.
(3)	Mother of Coal	3 in.
(2)	Coal Smut	1 ft. 1½ in.
(1)	*Fire Clay*	1 ft. 0 in.

This out-cropping appears to have a dip of 3° to 4° to NEN.

About 100 yards still farther down the above branch or to the NWN., there is an other coal out-cropping which is doubtless of the same seam as the last. At this out-cropping the coal has been dug down into to a thickness of three feet, without getting through it, when the digging had to be stopped on account of the rapid inflow of water. This out-cropping appeared to have a dip of 15° to 20° to the north-east. The above out-croppings on this branch are likely of the two seams (44) and (43) of the *General Section.*

At the crossing of Burnside Creek, in the S. W. ¼ of S. 32, T. 19, R. 7 W., there are massive sandstones which seem to dip 15° to 20° to the north-east and just up the road, or north-east of this ford, sets in a thick bed of shale, which appears to have a dip of only 3° to 4° to the north-west. Under this shale, there is a thick out-cropping of coal in

Mr. Andrew Burchfield's field, in the S. W. ¼ of S. W. ¼ of S. 32, T. 19, R. 7 W., about as follows:

Coal Out-Croppings in Mr. Andrew Burchfield's field, in the S. W. ¼ of S. W. ¼ of S. 32, T. 19, R. 7 W.

(7)	*Shale*; thick bed, cover.	
(6)	COAL SMUT	2 in.
(5)	*Slate*; clayey	1½ in.
(4)	COAL SMUT; about	7 ft. 0 in.
(3)	*Slate*	2 in.
(2)	COAL SMUT	1 ft. 3 in.
(1)	*Fire Clay*	1 ft. 2 in.

This out-cropping is doubtless of (33) of the *General Section.*

There is an out-cropping of this same seam of coal in the S. E. ¼ of S. W. ¼ of S. 29, T. 19, R. 7 W., some fifteen feet lower than the above. About 150 yards NWN. of this last out-cropping and some forty-five feet below it, there is an out-cropping of coal of which only the top of the coal could be seen. This coal is covered for four to five feet by a hard gritty shale and then by sandstone. It is likely of the seam (32) of the *General Section.* The dip at this out-cropping is 3° to 5°, seemingly to the north-east, though most likely to the north-west.

On Cane Creek, about one-half mile NWN. of the last mentioned out-cropping of coal, or in the S. E. ¼ of S. E. ¼ of S. 30, T. 19, R. 7 W., there is in the back part of a large rock house, an out-cropping of hard coal about six inches thick. The cover to this coal for about eighteen inches is a hard gritty grayish blue slate and then massive sandstones, which project out beyond the edge of the coal some ten to twelve feet, forming the cover to the rock-house. About one-fourth of a mile up the creek from this out-cropping, the bed of the creek for forty to fifty yards is said to be one sheet of coal from three to four feet thick, and down the creek, several hundred yards below the above rock-house, there is said to be coal in the creek. The coal in the rock-house is believed to be of the upper seam of (31) of the *General Section.*

The massive conglomerates between (38) and (39) of the *General Section.* which occur on the north side of Davis Creek above the coal out-cropping on Big Coal Bed Branch, in the S. E. ¼ of S. E. ¼ of S. 7, T. 19, R. 7 W., and in Mr. B. E. Thompson's spring, in the N. E. ¼ of N. W. ¼ of S. 17, T. 19, R. 7 W., also show in the road on the south side of Davis Creek and south of Hayes' P. O., on the side of the hill, some 200 feet above the level of low water in Davis Creek at the bridge just below Mr. B. E. Thompson's Mill or Hayes' P. O. On the side of the hill some seventy feet over these conglomerates, there sets in a bed of rounded pebbles of the Drift, about twenty feet thick, which is covered by a red sandy loam, about seventy-five feet in thickness, that caps the high divide. These pebbles of the Drift are nearly all of flint, though some few are of coarse, oolitic looking sandstones and others of fine grain sandstones; they are of all colors and among them may be found specimens of Jasper, Chalcedony, etc. In the capping red sandy loam, there is frequently to be seen lumps of iron conglomerates. The large growth of the very summits of this high divide south of Davis Creek, over the above sandy loam of the Drift, is principally of long leaf pine, while in the ravines and hollows of this high divide, the growth is principally of black-jacks and post-oaks. The country over the top of this high divide is beautiful; it is covered with a fine growth of grasses but has no undergrowth, and is just deep enough indented with hollows and ravines to do away with all sameness of scenery and to make it pleasing to the eye.

High up on the side of this divide, some eighty to ninety feet over the above conglomerates, there is in the N. W. ¼ of S. E. ¼ of S. 15, T. 19, R. 8 W., the following out-cropping of coal which is doubtless of (43) of the *General Section :*

Out-Cropping in the N. W. ¼ of S. E. ¼ of S. 15, *T.* 19, *R.* 8 *W.*

(9)	*Debris, Soil;* to top of ridge, about	60 ft. 0 in.
(8)	COAL; shaly, crumbling easily	9 in.
(7)	*Slate*; black	⅛ in.

(6)	COAL	11 in.
(5)	*Slate, Mother of Coal;* soft	3½ in.
(4)	COAL	4½ in.
(3)	*Slate*	½ in.
(2)	COAL	6 in.
(1)	*Fire Clay.*	

There is doubtless more coal below (1) of the above section.

Near Mr. Jessie Barger's, in the S. E. ¼ of S. E. ¼ of S. 9, T. 19, R. 8 W., there is said to be an out-cropping of coal about twelve inches thick with a very white clay underbed; it is likely of (42) of the *General Section.*

In a deep hollow in the N. E. ¼ of S. 10, T. 19, R. 8 W., some 200 feet below the out-cropping of the last section, there is the following out-cropping of coal which is likely of (35) of the *General Section.*

Out-Cropping in the N. E. ¼ of S. 10, T. 19, R. 8 W.

(6)	*Sandstones;* flaggy and shaly.	
(5)	*Shale*; hard and gritty	10 in.
(4)	COAL	10 in.
(3)	*Slate*; black	⅛ in.
(2)	COAL	2 in.
(1)	*Fire Clay*; very fosiliferous.	

In an other out-cropping forty to fifty steps lower down the branch, the coal is much better in quality and is about sixteen inches thick without any partings; it is believed to be the same coal, though this lower out-cropping might be of a lower bench of the same seam.

In deep hollows in the N. W. ¼ of N. W. ¼ of S. 3, and N. E. ¼ of N. E. ¼ of S. 24, T. 19, R. 8 W., there are said to be out-croppings of coal from eight to ten inches thick, which are likely also of (35) of the *General Section.*

On a branch in the S. W. ¼ of N. W. ¼ of S. 33, T. 19, R. 8 W., there can be seen the top of an out-cropping of coal from which a boat load of coal was raised years ago and floated down the river to Mobile. This coal out-cropping is over 150 feet above the level of low water in the river and is probably of (40) of the *General Section.* In Mr.

David Barger's well on top of the high divide in the S. W. ¼ of N. W. ¼ of S. 32, T. 19, R. 8 W., there is said to be a seam of coal which was dug down into about two feet without getting through it. It is likely of (43) of the *General Section.* In Pegues Creek, wrongly called Pigeon Creek on the maps, there is said to be, in the S. E. corner of S. 29, T. 19, R. 8 W., an out-cropping of a seam of coal four inches thick. Down the creek from this out-cropping or to the south-west about one and a quarter miles, in the N. W. ¼ of S. W. ¼ of S. 32, T. 19, R. 8 W., and some thirty to forty feet lower, and about fifty feet above the river, there shows the lower five inches of a seam of coal from which boat loads of coal have been raised and floated down the river. This out-cropping is believed to be of a seam not more than twelve inches thick, though of this we can not say for certain as it is covered by debris. It may be one of the benches of a seam with thick partings, as coal out-croppings occur farther down the creek four and five feet lower. The underbed is of hard shale. The rocks along the creek near this out-cropping are in long flat waves from north-east to south-west, though they have a general dip to the south-west. These out-croppings of coal along Pegues Creek are believed to be of (37) and (36) of the *General Section.*

On Rose Branch in the N. E. corner of S. 6, T. 20, R. 8 W. about twenty-five feet above the level of low water in the river, there is the following out-cropping of coal:

Out-Cropping on Rose Branch,
in the N. E. corner of S. 6, T. 20, R. 8 W.

(6)	*Sandstone*; massive.	
(5)	*Sandstone, Shale;* bluffy	8 ft. 0 in.
(4)	COAL	1½ in.
(3)	*Slate*; shaly	¾ in.
(2)	COAL; cubical	6 in.
(1)	*Fire Clay*; fossiliferous, visible	1 ft. 0 in.

This out-cropping is of (36) of the *General Section;* it seems to have a dip of 2° to 3° to the north-east.

Under the river bluff, about one-half mile below the Wallace old ferry, or in the S. E. ¼ of S. E. ¼ of S. 6, T. 20, R. 8 W., there is the following out-cropping:

Out-Cropping in the S. E. ¼ of S. E. ¼ of S. 6, T. 20, R. 8 W.

(8)	*Sandstone;* bluff.	20 ft. 0 in.
(7)	*Sandstone*; slaty, with streaks of coal	2 in.
(6)	Coal	10 in.
(5)	*Slate*	2 in.
(4)	Coal	½ in.
(3)	*Slate*	½ in
(2)	Coal	2 in.
(1)	*Slate*; hard, visible	3 ft. 0 in.

This coal is some seventy feet above the river and dips 6° to 8° to the north-east.

Some twenty feet higher than this last out-cropping of coal, there is in the bed of a branch, in the N. E. ¼ of S. W. ¼ of S. 6, T. 20, R. 8 W., an out-cropping of cubical coal about six inches thick, with a seeming dip of 2° to 3° to the north-east. These last two out-croppings of coal are doubtless of (38) and (39) of the *General Section.*

In Bluff Creek, in the S. W. ¼ of S. E. ¼ of S. 5, T. 20, R. 8 W., there is said to be an out-cropping of coal about eight inches thick, which is probably of (35) of the *General Section.* The rocks along Bluff Creek, in the S. W. ¼ of N. W. ¼ of S. 4, T. 20, R. 8 W., dip to the south-west. The top of the ridge or divide south of Bluff Creek or between Bluff and Daniel creeks is over 300 feet above these creeks, and on the sides of these divides there are to be seen several thick ledges of massive coarse grain sandstones, one of which is doubtless a conglomerate. In the deep ravine leading up into this high divide from Bluff Creek, there are some noble trees of poplar; the growth over the top of this divide is principally long leaf pine. Some sixty to seventy feet below the top of this divide, there is an out-cropping of coal at Mr. Berry Battle's spring, in the S. W. ¼ of S. W. ¼ of S. 10, T. 20, R. 8 W., which is reported to be about eighteen inches thick; it is doubtless of (50) of the *General Section.* Some 100 feet or more below this out-cropping at Mr. Battle's spring, there is in the N. W. corner of S. 16,

T. 20, R. 8 W., an out-cropping of the thick coal (47) of the *General Section*, in what is known as the *Keene Coal Bed.* The coal out-cropping at this bed, according to Maj. W. J. Kelley, who had it dug through, is as follows:

Section of Coal Out-Cropping at the "Keene Bed," in the N. W. corner of S. 16, T. 20, R. 8 W.

(15)	*Slate.*	
(14)	COAL	1 ft. 3½ in.
(13)	*Slate*	4¾ in.
(12)	COAL	6½ in.
(11)	*Slate*	1¼ in.
(10)	COAL	8½ in.
(9)	*Slate*	1 in.
(8)	COAL	6 in.
(7)	*Slate.*	2 in.
(6)	COAL	5¼ in.
(5)	*Slate;* parting	2 ft. 0 in.
(4)	COAL	8½ in.
(3)	*Slate*	3½ in.
(2)	COAL	1 ft. 8½ in.
(1)	*Fire Clay*; underbed.	

Something over 150 feet below this out-cropping, there is in Daniel's Creek, near the center of the S. W. ¼ of S. 16, T. 20, R. 8 W., an out-cropping of coal about twelve inches thick under a bluff of massive conglomerates, with the pebbles, mostly black and not very round, confined in patches to the lower four to five feet. This coal is the *upper bench* of (38) of the *General Section.* It dips to the north-east, as down the creek about 200 yards NEN., it is under the water or the dip in this distance has been eighteen inches more than the fall in the creek. Still farther down the creek or across a bend WNW. from this last coal out-cropping, there is said to be an out-cropping of coal which is perhaps of this same seam.

Up the creek from the coal near the center of the S. W. ¼ of S. 16, T. 20, R. 8 W., there is near the center of the same section an out-cropping of coal, which is doubtless of the same seam, though no conglomerates were seen near it. This out-cropping is as follows:

Out-Cropping near the center of S. 16, *T.* 20, *R.* 8 *W.*

(7)	*Shale;* gritty and micaceous, bluff.	
(6)	Coal	1 ft. 1½ in.
(5)	*Slate*	3 in.
(4)	Coal	6½ in.
(3)	*Slate*; hard	¼ in.
(2)	Coal	4½ in.
(1)	*Slate*; hard.	

Up the creek, to the south-east some seventy-five yards and 400 yards, there are other out-croppings from which boat loads of coal have been raised. The out-cropping farthest up the creek is said to be about ten inches thick, and like that under the conglomerate lower down the creek is called block coal because it breaks up in blocks. These *block coals* are said to be very pure and excellent coals. Some forty feet above this coal in Daniel's Creek, there is under a bluff, in the N. E. ¼ of S. W. ¼ of S. 16, T. 20, R. 8 W., the following out-cropping:

Out-Cropping in the N. E. ¼ *of S. W.* ¼ *of S.* 16, *T.* 20, *R.* 8 *W.*

(4)	*Sandstones*; massive, micaceous, slaty color, forms a high bluff.	
(3)	*Shale*; bluish color	1 ft. 3 in.
(2)	Coal	5 in.
(1)	*Shale*; hard, gritty, micaceous, fossiliferous and of a bluish color, visible	10 ft. 0 in.

These coal out-crops along Daniel Creek are believed to be of (38) and (39) of the *General Section.*

In the Eddin's Road on the north side of Daniel's Creek, nearly 200 feet above the creek at the ford and some forty feet below the top of the divide, there is an out-cropping of coal smut about eighteen inches thick, which is of (50) of the *General Section.* In this same road, as it ascends the ridge on the south side of Daniel's Creek, there is about twenty-five feet above low water in the creek an out-cropping of coal smut from five to six inches thick. It is likely of the same seam as the out-crop in the bluff, in the N. E. ¼ of S. W. ¼ of S. 16, T. 20, R. 8 W. Higher up the road and hill, some sixty-five feet above Daniel Creek or forty feet above the last coal smut, there is an out-cropping of coal smut from six to eight inches thick; still higher up the road and hill, about 180 feet above the creek, there is an out-cropping of coal smut about thirty-two inches thick. This smut is likely of (49) of the *General Section*.

Some half dozen seams of coal therefore show on Daniel's Creek below the crossing of the Eddin's road, about as follows:

Approximate Section of Visible Coal Out-Crops on Daniel's Creek, near its Mouth.

	Measures	60 ft. 0 in.
(6)	COAL; at Beiry Battle's Spring	1 ft. 6 in.
	Measures	55 ft. 0 in.
(5)	COAL SMUT	1 ft. 6 in.
	Fire Clay; about	2 ft. 0 in.
	COAL SMUT	2 ft. 8 in.
	Measures	45 ft. 0 in.
(4)	COAL; Keene bed	8 ft. 10 in.
	Measures	70 ft. 0 in.
(3)	COAL SMUT; visible only	8 in.
	Measures	45 ft. 0 in.
(2)	COAL SMUT	6 in.
	Measures, CONGLOMERATES	20 ft. 0 in.
(1)	COAL; (38) of the *General Section*	2 ft. 3 in.

Along Rock House Creek in S's 14 and 13, T. 20, R. 8 W. and S. 7, T. 20, R. 7 W., there are several out-croppings of the thick seam of coal (48) of the *General Section*. The following are sections of out-crops of this seam of coal in S's 7 and 18, T. 20, R. 7 W.

Sections of Out-Crops of (48) *of the "General Section," in S's* 7 *and* 18, *T.* 20, *R.* 7 *W.*

		(1)	(2)	(3)
(10)	COAL	8½ in.	17 in.	16 in.
(9)	*Slate*	4 in.	2 in.	3 in.
(8)	COAL	3½ in.	9½ in.	8 in.
(7)	*Slate*	½ in.	1½ in.	1½ in.
(6)	COAL	15½ in.	10 in.	Coal.....40 in.
(5)	*Slate*	2 in.	½ in.	
(4)	COAL	13 in.	12 in.	

(3)	*Fire Clay*; parting	42 in.	36 in.	38 in.
(2)	COAL	32 in.	28 in.	just visible.
(1)	*Fire Clay.*			

No. 1 is of an out-cropping which is also known as the *Burchfield Bed No. 1*; it is near the center of S. 7, T. 20, R. 7 W. Thousands of bushels of coal have been dug from this out-cropping and hauled in wagons to Tuscaloosa. This business, however, ceased with the building of the Alabama Great Southern Railroad. The dip at this out-crop appears to be 3° to 4° to the north-east.

No. 2 is an out-cropping at the *Haldman Bed* in the south-west corner of S. 18, T. 20, R. 7 W. and occurs in the State Geologist's reports for 1875, 1877-1878 and 1879-1880.

No. 3 is of the *Haldman Bed* in the N. E. ¼ of N. W. ¼ of S. 18, T. 20, R. 7 W.

About twenty-five feet over the out-cropping of *Section* (3) above, there is an out-cropping of coal smut about two feet in thickness. It is of (49) of the *General Section.* In the S. W. ¼ of S. 18, T. 20, R. 7 W., there are out-croppings of coal which are known as the *Burchfield Bed No.* 3. The coal in these out-croppings is reported to be about forty inches thick; the seam furnishes so much water that it is almost impossible to dig through these out-crops unless there is some way to run off the water. The State Geologist gives, in his report for 1879-1880, the following section of the coal at these out-crops:

Section of Burchfield Bed No. 3,
in the S. W. ¼ of S. 18, *T.* 20, *R.* 7 *W.*

(5)	COAL	1 ft. 3 in.
(4)	*Slate*	½ in.
(3)	COAL	6 in.
(2)	*Slate*	1 in.
(1)	COAL	1 ft. 7½ in.

This coal is of (50) of the *General Section.*

In the N. W. ¼ of S. 19, T. 20, R. 7 W., there are out-crops of a seam of coal about twenty feet lower than that of the last section, which is reported to be two feet four inches thick and to have no partings. It is of (49) of the *General Section.*

In the S. E. ¼ of N. W. ¼ of S. 27, T. 20, R. 8 W. are the old *Eddin's Mines.* These mines were worked by drifts and were, according to Prof. Tuomy, the second instance of mining enterprise in the State. The following is a section of the coal seam at these old mines :

Section of Coal Seam in Eddins Old Mines, in the S. E. ¼ of N. W. ¼ of S. 27, T. 20, R. 8 W.

(7)	COAL	1 ft. 3 in.
(6)	*Shale*	5 in.
(5)	COAL	9 in.
(4)	*Shale*	1½ in.
(3)	COAL	7 in.
(2)	*Shale*	1 in.
(1)	COAL	9 in.

This is doubtless of (50) of the *General Section.* Four to five feet above this coal, with deep blue clayey shale or *soap-stone* intervening, there is a conformable strata of ferruginous conglomerate about eighteen inches thick; it is believed to be of the Coal Measures.

At the School House, in the N. E. ¼ of S. W. ¼ of S. 27, T. 20, R. 8 W., there are other out-croppings of this same seam of coal. The coal at these out-croppings is covered for six to seven feet by deep blue shale and then by massive sandstone, coarse grained and micaceous and of a yellowish color.

South of the above School House about one-quarter of a mile, there is an out-cropping of a lower seam of coal, (49) of the *General Section.* This is doubtless the seam of coal that has been said to resemble *cannel coal* and of which the following analysis has been given to the State Geologist in his report for 1879-1880:

Specific Gravity	1.348
Sulphur	2.752
Moisture	.830
Volatile Matter	36.207

Fixed Carbon	48.319
Ash	14.644
	100.000

In the N. W. ¼ of N. W. ¼ of S. 34, T. 20, R. 8 W., there is an other out-cropping of (50) of the *General Section* or of the *Eddins' seam*, and in the N. W. ¼ of S. 35, T. 20, R. 8 W., there are out-croppings of both (49) and (50) of the *General Section*, at what is known as the *Mallet Beds*. The lower of these, the so-called *cannel coal*, is about thirty inches thick; it is a smutless, shiny, jet black coal, that has an excellent reputation as a black-smithing and coking coal for foundry uses, though it seems to contain considerable iron pyrites, which is also shown by the large percentage of sulphur in the above analysis. Here at the *Mallet beds*, the upper seam of coal or (50) of the *General Section*, is some 250 yards higher up the branch snd some thirty feet higher than the out-cropping of (49) of the *General Section* or the *Mallet bed* proper. The lower of these seams also crops out in the S. E. ¼ of S. E. ¼ of S. 27, T. 20, R. 8 W., several feet higher than at the *Mallet beds;* and in the S. E. ¼ of N. E. ¼ of S. 34, T. 20, R. 8 W., several feet lower than at the *Mallet beds*, hence it is seemingly in waves from N. E. to S. W. Up the branch, or south from this last out-cropping, about 300 yards and some twenty-five feet higher, there is an other out-cropping of (50) of the *General Section*. At this out-cropping, it is about four feet six inches thick. This coal crops out also in the S. E. ¼ of N. W. ¼ of S. 34, T. 20, R. 8 W. and from this out-cropping large quantities of coal have been raised and hauled in wagons to the river and loaded on flat boats and floated to Mobile. At this out-cropping, the dip seems to be to the north-east.

Near a spring in the N. W. ¼ of S. E. ¼ of S. 36, T. 20, R. 8 W., there are two out-croppings of the coal (49) of the *General Section*, in what are known as the *Toxey Beds*. These out-crops are from eighteen to twenty-four inches thick and are mostly under water, which is always present in the old pits from which the coal has been raised. They appear to dip to the south-west. At the spring which is SWS. of these out-crops and some fifteen feet above them, there is some strong chalybeate water, which, together with the main spring, doubtless rises in the coal seam (50) of the *General Section.*

In the S. W. ¼ of S. 30, T. 10, R. 7 W., there is the following out-cropping of, we believe, the coal (50) of the *General Section*, in what is known as the *Pitcher Bed:*

Coal Out-Cropping at the "Pitcher Bed," in the S. W. ¼ of S. 29, T. 20, R. 7 W.

(9)	COAL	8 in.	*Upper group*	2 ft. 2 in.
(8)	*Shale*	10 in.		
(7)	COAL	8 in.		
(6)	*Clay*; mottled, parting			3 ft. 6 in.
(5)	COAL	1 ft. 7 in.	*Lower group*	3 ft. 8 in.
(4)	*Shale*	2 in.		
(3)	COAL	8 in.		
(2)	*Shale*; black	3 in.		
(1)	COAL	1 ft. 0 in.		

This out-cropping, we believe, is of (50) of the *General Section*, with the addition of the *upper group* to its usual thickness.

The dip at this out-cropping is 2° to 3° to the ENE. This same seam of coal also shows in the Wild Cat road not very far from the *Pitcher bed.* Nearly one-half mile north of the Pitcher bed and some forty-five feet lower than the *Pitcher bed*, there is an out-cropping of, we believe, the coal seam (47) of the *General Section*, in the N. W. ¼ of S. 29, T. 20, R. 7 W., in what is known as the *Nat. Burchfield Bed.* Between the seams of the Pitcher and Nat. Burchfield coal beds, there are some massive red sandstones. In the Wild Cat road on the side of the hill on the south side of Daniel Creek and in the same *forty* as the Nat. Burchfield bed, there is an other out-cropping of the Pitcher seam, (50) of the *General Section.*

In the N. E. ¼ of N. E. ¼ of S. 30, T. 20, R. 7 W., there is an out-cropping of the coal seam (48) of the *General Section* in what is known as the *Cleveland Bed.* At this out-cropping, the coal is said to be forty-two inches thick. It is some twenty-five feet lower than the *Pitcher bed.* A great deal of coal was raised from the *Cleveland bed* thirty-five and forty years ago and hauled in wagons to Tuscaloosa.

In the S. E. ¼ of N. W. ¼ of S. 29, T. 20, R. 7 W., there are numerous out-crops of the coals from (40) to (50), inclusive, of the *General Section.* In the N. E. ¼ of S. W. ¼ of S. 29, T. 20, R. 7 W., there is the following out-cropping of coal at what is known as the *Jones Bed:*

Coal Out-Cropping,
in the N. E. ¼ of S. W. ¼ of S. 29, T. 20, R. 7 W.

(9)	COAL SMUT	9 in.
(8)	*Slate*	7 in.
(7)	COAL	10 in.
(6)	*Fire Clay*; parting	3 ft. 6 in.
(5)	COAL	1 ft. 7 in.
(4)	*Slate*	½ in.
(3)	COAL	11 in.
(2)	*Slate*	1 in.
(1)	COAL	1 ft. 3 in.

This out-cropping is of (50) of the *General Section,* thickened as in case of the *Pitcher bed.* This coal has a distinct *face and butt* structure. On the side of the hill, several hundred yards west of this last out-cropping and some thirty-five feet above it, there is on the root of a blown up tree an out-cropping of coal which is doubtless of (53) of the *General Section.*

Some twenty-five feet below the out-cropping of the *Jones bed*, there is in the S. E. ¼ of S. W. ¼ of S. 29, T. 20, R. 7 W., the following out-crop, which is believed to be of the seam (48) of the *General Section*, in what is known as the *Hart Bed*:

Section of Coal Out-Cropping at the "Hart Bed,"
in S. E. ¼ of S. W. ¼ of S. 29, T. 20, R. 7 W.

(12)	*Shale*; massive, curly, fossiliferous	6 ft. 0 in.
(11)	COAL; shaly	3 in.
(10)	*Mother of Coal*	½ in.
(9)	COAL	10½ in.
(8)	*Slate*, COAL	1 in.
(7)	COAL	5½ in.

(6)	*Slate*, COAL	½ in.
(5)	COAL	5 in.
(4)	*Slate*, COAL	½
(3)	COAL	7½ in.
(2)	*Slate*	½ in.
(1)	COAL	9 in.

A great deal of coal was raised from this bed years ago and hauled in wagons to Tuscaloosa. Some fifty steps farther down the branch, this seam of coal again shows itself, and about fifty yards to the SWS. from this last out-cropping and some twenty-five feet above it, there is an out-cropping of about ten inches of coal, which would lead back to the thick seam (50) of the *General Section.* About twelve inches of coal smut also showed some 100 yards west of the *Hart bed* near the same level as this last out-cropping; it had slaty partings, and WSW. from it, about 100 yards, there is a coal out-cropping which is believed to be of (50) of the *General Section.* At this last out-cropping, there is the upper eighteen inches of coal visible. On the side of the hill some twenty feet above the thick seam (48) of the *General Section.*, there is coal smut of (49) of the *General Section.* Above this upper out-cropping, there is ferruginous conglomerate from eight to ten feet thick, which we believe is of the conglomerate between (51) and (52) of the *General Section.*

In the N. W. ¼ of N. W. ¼ of S. 32, T. 20, R. 7 W., there is an out-cropping about forty-five inches thick of the slaty seam (50) of the *General Section.* SWS. from this out-cropping, about one-fourth of a mile, or in the S. W. ¼ of N. W. ¼ of S. 32, T. 20, R. 7 W., and some twenty-five feet higher, there is an out-cropping of coal smut about ten inches thick, and some ten feet higher, there is an other out-cropping of coal smut of about the same thickness. The upper of these out-crops, of ten inches thickness, of coal smut also shows on the side of a hill about seventy-five yards farther to the south-east. These two out-croppings of ten inches thickness, are likely of the *upper group* of (50) of the *General Section.* In the same *forty* as this last coal out-cropping, or in the S. W. ¼ of N. W. ¼ of S. 32, T. 20, R. 7 W., and some forty feet below it, there is an old coal bed from which much coal was raised years ago. A few feet over the coal of this old bed, there sets in a massive, micaceous, orange sandstone. The coal of this old bed is doubtlnss of (48) of the *General Section.* Some 250 yards east of this old coal bed and about ten feet higher, there is an out-cropping of (49) of the *General Section*, in which about twenty inches of coal was visible.

On a branch in the S. E. ¼ of N. W. ¼ of S. 30, T. 20, R. 7 W., there are the out-croppings of two seams of coal which are below the seam of the *Hart bed* or are (43) and (42) of the *General Section.* The upper of these crops out as follows:

Out-Cropping in the S. E. ¼ of N. W. ¼ of S. 30, T. 20, R. 7 W.

		1	(1)	(2)
(8)	*Sandstones*	10 ft. 0 in.	3 ft. 0 in.	*Sandstone roof.*
(7)	*Shale*; gritty	3 ft. 0 in	14 in.	
(6)	COAL	8½ in.	COAL 14 in.	19½ in.
(5)	*Slate*	1 in.		
(4)	COAL	10½ in.		
(3)	*Slate*	¾ in	½ in	1 in.
(2)	COAL	14 in.	14 in	13 in.
(1)	*Shale.*			

Section (1) is about 150 yards down the branch or to the SES. of (2) and is some ten feet higher. . Section (3) is of the *Thomas bed* in S. 27, T. 20, R. 7 W., as given in the Geological Report for 1877-1878; it is doubtless of the same seam. Some twelve feet under the out-cropping of (1) of the above section, there is a fossiliferous clayey slate about sixteen inches thick with streaks of coal as thick as one-half of an inch.

Along a branch, in the N. W. ¼ of N. W. ¼ of S. 32, T. 20 R. 7 W., there was noticed two sets of craw-fish holes from which there had been pushed up lumps of coal. Between these two tets of holes were massive sandstones. The coals pushed up from these craw-fish holes are believed to have come from the seams (49) and (50) of the *General Section.* Farther up the branch, there is an out-cropping of a higher seam or (53) of the *General Section.* The coal smut of this out-cropping was visible to a thickness of about three feet. Some fifty yards WNW. of this coal smut and doubtless of the same seam, are the old surface diggings which are known as the "*Pearson Bed.*" Over the ridge, WSW. about one-fourth of a mile, in the N. E. ¼ of N. E. ¼ of S. 31, T. 20, R. 8 W., are the old coal pits which are known as the *Thompson Bed.* The coal mined at this bed is said to be about twenty inches thick; it is doubtless of the same seam as the *Pearson bed* or is of (53) of the *General Section.* The coal from the *Pearson* and *Thompson beds* is said to be hard and good. It does not come out in blocks and hence has no planes of cleavage, and when hauled to Tuscaloosa, years ago, it had an excellent reputation for black-smithing and foundry uses.

At Mr. Luke Williams' spring, in the N. E. ¼ of N. W. ¼ S. 5, T. 21, R. 7 W., there is the following out-cropping:

Out-Cropping at Mr. Luke Williams' Spring, in the N. E. ¼ of N. W. ¼ of S. 5, T. 21, R. 7 W.

(5)	*Debris.*	
(4)	COAL	2 in.
(3)	*Clay Slate*	4 in.
(2)	COAL; very hard	1 ft. 11 in.
(1)	*Slate*; clayey, just visible, may be a parting.	

This out-cropping is probably of (43) of the *General Section.*

On Little Hurricane Creek, in the N. W. ¼ of S. E. ¼ of S. 5, T. 21, R. 7 W., there is a few inches above the water, in a bluff of hard shales, a seam of very hard coal about five inches thick. This coal is of (37) of the *General Section.* Some thirty-five to forty feet higher than this last out-cropping, there is on a branch in the S. E. ¼ of S. 5, T. 21, R. 7 W., an other out-cropping of coal about five inches thick. It has a dip of several degrees to the north-west. Farther up this branch, to the north-east about 200 yards and some ten feet higher, there is an out-cropping of a very hard coal about thirteen inches thick; it is believed to be of a lower seam than the seam five inches thick, lower down the branch. Lower down the branch than the out-cropping of the seam that is five inches thick, there is said to be an out-cropping of coal ten inches thick.

On an other branch which comes into Little Hurricane from the opposite or northern side, there are, in the S. W. ¼ of S. W. ¼ of S. 28, T. 20, R. 7 W., several out-croppings of coal which are doubtless of the seams from (43) to (40). inclusive, of the *General Section*. The out-cropping of the upper of these seams or of (43) of the *General Section*, covers the bed of the branch for some ten to twelve feet and shows plainly the *face and butt* structure of the coal. The out-cropping of the next seam under this one is some 400 yards down the branch or to the south-east, and is some thirty-five feet perpendicularly under the upper one. It is of (41) of the *General Section*. The upper seam also shows on the side of the hill above the out-cropping of the second one. Some seventy-five yards still farther down the branch or to the SES. and about ten feet lower, there is an out-cropping of a cubical or *block coal* about fifteen inches thick. South of this out-cropping about one-fourth of a mile and some fifteen feet higher, there is, on an other prong of this same branch, an out-cropping of coal that is thought to be about eighteen inches thick. It may be of the same seam as the above *block coal*, which is thought to be (40) of the *General Section*.

In Little Hurricane Creek, as it passes through the N. E. ¼ of N. E. ¼ of S. 4, and the N. W. ¼ of N. W. ¼ of S. 3, T. 21, R. 7 W., there are several out-croppings of coal which are of the seams from (33) to (35), inclusive, of the *General Section*. The out-cropping of the upper of these seams, the one lowest down the creek, is said to be about two feet thick. Up the creek, north-east about 200 yards, there is an other coal out-cropping, which is said to be about one foot thick, and still higher up the creek, forty to fifty yards, there is more coal. These out-crops have a dip of 10° to 12° to the north-west. Still Higher up Little Hurricane Creek, there is in the N. W. ¼ of N. W. ¼ of S. 3, T. 21, R. 7 W., an out-cropping of coal that is pronounced three feet five inches thick. It is of (33) of the *General Section*. On the side of the hill some seventy-five yards south-east of this out-cropping and some twenty-five feet above it, there is the out-cropping, in this same seam, that is known as the *Stoker Field Bed*. The out-cropping at the *Stoker field bed*, has about the following section :

Out-Cropping at the " Stoker Field Bed,"
in the N. W. ¼ of N. W. ¼ of S. 3, T. 21, R. 7 W.

(3) *Shales*; clayey.
(2) COAL .... 3 ft. 6 in.
(1) *Shale*; hard.

This seam was drifted into some ten to twelve feet by the Southern Mining and Transportation Company and in this distance thickened a foot or more. Its dip is 10° to 12° to the north-west.

South of the Stoker Field Bed about one-half mile, a drift was driven by the same company for some 200 feet in on a seam of coal that is said to be of the same seam as that at the *Stoker field bed*, though seemingly it is much lower. At the mouth of this drift, the coal is reported to be only two inches thick, but that at the back part or head of the drift, it is eighteen inches thick.

About three-quarters of a mile up Little Hurricane Creek or east of the *Stoker field bed*, or in the N. E. ¼ of N. E. ¼ of S. 3, and N. W. ¼ of N. W. ¼ of S. 2, T. 21, R. 7 W., there are several coal out-crops which are known as the *White Coal Beds* and which are believed to be of the seams from (26) to (30) inclusive, of the *General Section*. At the out-cropping of the uppermost of these seams or at the old coal pits lowest down the creek, there is no coal visible, but in the next old coal pits up the creek, there is to be seen the following section:

Out-Cropping at " White's Coal Beds,"
in the N. E. ¼ of N. E. ¼ of S. 3, T. 21, R. 7 W.

(7) *Debris*.
(5) *Slate*; showing ....1 ft. 6 in.

(4)	COAL SMUT	2 in.
(3)	*Slate*	3 ft. 0 in.
(2)	COAL SMUT	2 ft. 6 in.
(1)	*Shale;* clayey.	

This out-cropping is probably of the *lower bench* of (28) of the *General Section.*

Up the creek or east from the out-cropping of this last section about 200 yards or in the N. W. ¼ of N. W. ¼ of S. 2, T. 20, R. 7 W., in one of the old pits of the uppermost of the *White coal beds,* the coal out-cropping appears to be about fifteen inches thick. This seam of coal is perhaps of (26) of the *General Section;* it is under a bluff of sandstones some forty-five feet high and has a dip of 20° to 25° to the north-west. In the piney woods, over the high sandy plateau on top of the divide south of Little Hurricane Creek, there are often seen *Salamander hills* which are always in groups and nearly always in curvilinear lines.

East of the *White coal beds* about one-half mile, there is in the N. W. ¼ of N. E. ¼ of S. 2, T. 21, R. 7 W., an out-cropping of coal which is not very far north-west of the line of the great fault between the *big* and *little basins.* This coal out-cropping is almost perpendicular; it contains many beautiful crystals of pyrites which on their discovery, a few years ago, created considerable excitement in the neighborhood, as they were taken for gold.

On the head-waters of Big Hurricane Creek or in the S. E. ¼ of N. W. ¼ of S. 12. T. 21, R. 7 W., there is an out-cropping of a thick seam of coal with slate partings. It is likely of (21) of the *General Section.* It is said to have been dug down into to a depth of forty inches without getting through it.

In the N. W. ¼ of S. W. ¼ of S. 12, T. 21, R. 7 W., there is an out-cropping of coal wih a dip of some 45° to the north-west. South-west of this out-cropping abcut 150 yards, there is in the S. W. ¼ of S. W. ¼ of S. 12, T. 21, R. 7 W. some old coal pits in the out-cropping of a seam of coal that is said to be about two feet thick. This out-cropping has a dip of about 15° to the north-west. These last two mentioned coal out-crops are within the *little basin* or are between the anticlinal fold and fault along the north-west edge of the *little basin.* This fold, however, here near the south-west end of the *little basin* seems to have about died out. The measures of this vicinity and to the south-west of the *little basin* are especially complicated and broken up. For a short distance the coarse conglomerates near the base of the measures along the south-east edge of the field, are entirely engulfed by a fault which has also swallowed up all the lower rocks down to the *Clinton.* Farther to the south-west, however, near Vance's Station on the Alabama Great Southern Railroad, these conglomerates are present to a great thickness with some *Sub-carboniferous* shales, but next to these shales are *Dolomitic rocks*, hence the *Clinton rocks* have here all been hid by the fault. These conglomerates, along the south-east edge of the field, are about perpendicular, though but a short ways within the measures they are lying almost flat and are perfectly naked over large areas. One of these bare or naked out-crops, in the S. W. ¼ of S. W. ¼ of S. 18, T. 21, R. 6 W., is known as the "Eight Acre Rock." This *eight acre rock* covers twenty-five to thirty acres and is almost bare of vegetation over its whole area. It is composed of coarse grains with a few pebbles which are principally confined to spots and streaks. It is of light and orange colors. It is almost level, though it has slight dips to the south-west and north-east, showing that it is of the top of a long flat wave running from north-east to south-west. The top, also, to a thickness of several feet, looks as if it might be falsely bedded, as the very indistinct seams of stratification for this distance down appear as if they might have a dip of about 20° to the south-west. The top or surface is very rough from irregularities in weathering. This rock shows to a thickness of some thirty feet, and is cut up by fissures from two to ten feet wide and twenty-five to thirty feet deep. These fissures run principally from north-east to south-west, though some of them are at right-angle to this direction. In these fissures there are growing trees eighteen inches and two feet in diameter and in some of them there are ferns. With these exceptions, and a few small spots on top of the rock which are covered with some hardy herbs and grasses, the "*eight acre rock*" forms a bare or naked spot of tweny-five to thirty acres. This *eight acre rock* also crops out on the side of a hill in the S. W. ¼ of N. W. ¼ of S. 18, T. 21, R. 6 W., where it seems to have a dip of 12° to 15° to the south-east and where there are to be seen loose boulders, which have been broken off from it, of the size of small houses.

Along a branch, in the N. W. ¼ of S. W. ¼ of S. 10, T. 21, R. 7 W., there are several out-crops of coal, which are most probably of the seams (29) and (30) of the *General Section.* The out-crop highest up the branch or of the uppermost seam is said to be about one foot thick, and in the out-crop lowest down the branch or of the lowest seam, the coal smut shows to a thickness of about twenty inches. Between these two out-crops, the other seam is said to crop out as alternate streaks of coal and slate to a thickness of four to five feet. The dip of these out-crops is about 30° to the north-west.

In the road near Mr. Marmaduke Williams', in the south-east corner of S. 9, T. 21, R. 7 W., there is an out-cropping of coal from four to six inches thick, over clay and under shale. This coal may be of the seams (24) or (25) of the *General Section.*

On Big Hurricane Creek, in the N. W. ¼ of N. W. ¼ of S. 15, T. 21, R. 7 W., there is the following out-crop of the thick seam (21) of the *General Section*:

Out-Cropping on "Big Hurricane Creek,"
in the N. W. ¼ of N. W. ¼ of S. 15, *T.* 21, *R.* 7 *W.*

(15)	*Debris.*	
(14)	COAL SMUT, *Slate*; in alternate streaks, visible	1 ft. 10 in.
(13)	*Slate*; about	3½ in.
(12)	COAL SMUT; with a few thin streaks of slate	1 ft. 8 in.
(11)	*Fire Clay*; about	11 in.
(10)	COAL SMUT	2 ft. 3 in.
(9)	*Slate*	1½ in.
(8)	COAL	½ in.
(7)	*Clay Slate*	1½ in.
(6)	COAL SMUT	½ in.
(5)	*Clay Slate*	1½ in.

(4)	Coal Smut	½ in.
(3)	*Clay Slate*	4 in.
(2)	Coal Smut	1 in.
(1)	*Fire Clay.*	1 ft. 6 in.

This out-crop has a dip of about 80° to the north-west; it is believed to be just to the north-west of the great fault between the two basins.

In front of Mr. Lum Ray's house, in the N. W. corner of S. 22, T. 21, R. 7 W., there is a very imperfect out-cropping of a thick seam of coal, which is believed to be of (28) of the *General Section*, about as follows:

Out-Cropping at Mr. Lum Ray's House, in the N. W. corner of S. 22, T. 21, R. 7 W.

(7)	*Sandstone*	25 ft. 0 in.
(6)	*Shale*	25 ft. 0 in.
(5)	Coal Smut; about	3 ft. 7 in.
(4)	*Slate*; clayey	1 ft. 6 in.
(3)	Coal Smut; about	1½ in.
(2)	*Fire Clay;* fossiliferous, about	6 ft. 6 in.
(1)	Coal Smut; visible, about	1 ft. 2 in.

At *Copperas Spring*, in the S. E. ¼ of S. E. ¼ of S. 16, T. 21, R. 7 W., there is a coal out-cropping which is said to be about two feet thick. Some four feet above this coal, with clay slate intervening, there is a streak of coal from three to four inches thick. This out-cropping is believed to be of the same seam as the *Stoker field bed* or (33) of the *General Section*. The dip of this out-cropping is some 20° to 25° degrees to the north-west.

In the N. W. ¼ of S. W. ¼ of S. 16, T. 21, R. 7 W., there is an out-cropping of coal which is reported to be four feet thick and which is believed to be of the same seam as the last or (33) of the *General Section*. This out-cropping, however, showed very imperfectly about as follows:

Out-Cropping in the N. W. ¼ of S. W. ¼ of S. 16, T. 21, R. 7 W.

(5)	*Sandstone.*	
(4)	*Shales, Debris*	6 ft. 0 in.
(3)	Coal Smut	2 in.
(2)	*Clay Slate*	1 ft. 1 in.
(1)	Coal; visible only	4 in.

The dip of this out-crop is about 20° seemingly to the south-west, though doubtless it is to the north-west.

On Big Hurricane Creek, in the S. W. ¼ of S. E. ¼ of S. 16, T. 21, R. 7 W., there are two Drifts of the Southern Mining and Transportation Company, into the out-crops of the same coal seam (33) of the *General Section*, which here has the following section:

Section of Coal Seam in the Drifts of the "Southern Mining and Transportation Company," in the S. W. ¼ of S. E. ¼ of S. 16, T. 21, R. 7 W.

(6)	*Sandstone*; massive, bluffy, about	30 ft. 0 in.
(5)	*Shale*	4 ft. 0 in.
(4)	COAL	3¼ in.
(3)	BLACK BAND; only in places, with bright golden specks of pyrites	¾ in.
(2)	COAL	from 2 ft. 1 in. to 2 ft. 9 in.
(1)	*Fire Clay*; full of fossils or plant impressions.	

About 400 yards SES. of these Drifts, across a bend of Big Hurricane Creek and in the banks of this creek, there is the following out-cropping:

Out-Cropping on "Big Hurricane Creek," in the N. W. ¼ of N. W. ¼ of S. 21, T. 21, R. 7 W.

(7)	*Sandstone, Shale*; forming a bluff	15 ft. 0 in.
(6)	COAL; slaty on top	6 in.
(5)	*Slate*	1 in.
(4)	COAL	3½ in.
(3)	*Clag Slate*	½ in.
(2)	COAL	3 in.
(1)	*Fire Clay*; underbed.	

Farther down Big Hurricane Creek, in the S. E. ¼ of S. W. ¼ of S. 17, T. 21, R. 7 W., there is an other drift which was driven by the same company and in the same coal seam as those above. The coal couldn't be seen in this drift, but in the out-crop just above the mouth of the drift, it appears about as follows:

Out-Cropping above the Mouth of the Drift, in the S. E. ¼ of S. W. ¼ of S. 17, T. 21, R. 7 W.

(4)	*Debris.*	
(3)	COAL SMUT.	2 in.
(2)	*Clay Slate*	3 ft. 2 in.
(1)	COAL SMUT; visible	1 ft. 8 in.

In the same *forty* as this last drift, about 300 yards WNW. of it, just over the ridge, there are two other drifts, facing each other, on opposite sides of a deep narrow ravine. The drifts into this ridge from opposite sides were to meet and form a tunnel through which the coal from the most westerly drift, or the one on the opposite or west side of the ravine, was to be conveyed to the shoot on the Company's railroad near the mouth of the last mentioned drift on Big Hurricane Creek. In the most easterly of these drifts in the ravine, both the main seam and the thin seam above it could be seen but in the other of these two drifts, the most westerly of all of these drifts, the thin seam could not be seen, but the main seam has about the following section :

Coal Out-Cropping in the Mouth of the Most Western of the Drifts, in S. E. ¼ of S. W. ¼ of S. 17, T. 21, R. 7 W.

(4)	*Sandstone.*	
(3)	*Shale*	4 ft. 0 in
(2)	COAL;	2 ft. 1 in. to 2 ft. 3 in.
(1)	*Fire Clay.*	

The coal of this drift has in it considerable iron pyrites. To the first three named of these drifts, the Southern Mining and Transportation Company had graded a wide guage railroad, nearly four miles long, out from the Alabama Great Southern Railroad at Dudley Station, and had laid most of this distance with cross-ties, when all work suddenly stopped on account, it is said, of the death of the President of the Company.

Some 100 feet or more above the coal seam of these drifts, there is an out-cropping, in the S. W. ¼ of N. E. ¼ of S. 17, T. 21, R. 7 W. of what is known as the *clay root seam* which is believed to be (35) of the *General Section.* The coal of this clay root seam is said to be about fifteen inches thick.

The Alabama Mining and Transportation Company have a slope, which is known as the *Dudley Slope*, in the S. E. ¼ of N. W. ¼ of S. 32, T. 21, R. 7 W., near where their railroad leaves the Alabama Great Southern Railroad. The Company had gone to a very heavy expense here at this slope, in fitting up of the mine, the building of houses, etc., etc., and had every thing in *tip-top shape* for the mining of coal on a very large scale, when the works were abandoned and left to go to waste. The coal seam of this slope is believed to be the *upper group* of (28) of the *General Section* or of the same seam as Cal. Williams' *upper bed*, Jefferson county. It is said by Mr. William Gould to have the following section:

Section of Coal Seam in the "Dudley Slope,"
in the S. E. ¼ of N. W. ¼ of S. 32, T. 21, R. 7 W.

(9)	COAL; slaty	8 in.
(8)	*Fire Clay*	6 in.
(7)	COAL	1 ft. 1 in.
(6)	*Fire Clay*	½ in.
(5)	COAL	1 ft. 0 in.
(4)	*Fire Clay*; about	1 ft. 9 in
(3)	COAL; slaty	8 in.
(2)	*Fire Clay*	1 ft. 0 in.
(1)	*Sandstone.*	

The strata at the mouth of this slope have a dip of about 15° to the north-west.

Several hundred yards to the south of the above slope and not very far from the edge of the Warrior coal field or the anticlinal valley (Jones Valley), there is in the N. E. ¼ of S. W. ¼ of S. 32, T. 21, R. 7 W., the *William Gould old slope*. This slope is said by Mr. Gould to be down on the same seam of coal, the *upper group* of (28) of the *General Section*, as the *Dudley Slope*, which in the *Gould Slope*, is reported by Mr. Gould to have the following section:

Section of Coal Seam in the Gould Slope, in the N. E. ¼ of S. W. ¼ S. 32, T. 21, R. 7 W.

(9)	Coal; slaty	8 in.
(8)	*Slate*; clayey	8 ft. 0 in.
(7)	Coal	1 ft. 2 in.
(6)	*Fire Clay*	¼ in.
(5)	Coal	1 ft. 0 in.
(4)	*Fire Clay*	1 ft. 8 in.
(3)	Coal, *Slate*	10 in.
(2)	*Fire Clay*	1 ft. 0 in.
(1)	*Sandstone*.	

Mr. Gould says that between this slope and the *Dudley Slope*, there runs a fault along which the strata have received a vertical displacement of 1000 feet. This vertical displacement has taken place either in the upheavel of the east or *Gould Slope* side, and this is much the most probable, or in the *down-throw* of the west or *Dudley Slope* side. This great fault here runs about north and south and is the fault that cuts off the *little basin* from the rest of the Warrior coal field.

Mr. William Gould gives the following as an approximate section of the measures in the S. W. corner of T. 21, R. 7 W.

Approximate Section of the Measures in the S. W. Corner of T. 21, R. 7 W., and the S. E. Corner of T. 21. R. 7 W.

(6)	Coal; Wildsmith, Clement's	3 ft. 5 in.
	Measures	30 ft. 0 in.
(5)	Coal	1½ in.
	Measures	170 ft. 0 in.
(4)	Coal	1 ft. 0 in.
	Measures	100 ft. 0 in.
(3)	Coal	1 ft. 2 in.
	Measures	40 ft. 0 in.
(2)	Coal; (30) of the *General Section*	2 ft. 8 in.
	Measures	150 ft. 0 in.
(1)	Coal; Dudley and Gould Slopes	6 ft. 8 in.

The thickness of strata between some of the coal seams of the above section are doubtless too great. These coals, we believe, correspond to those from (28) to (33), inclusive, of the *General Section*.

The coal (2) of the approximate section is said by Mr. Gould to have the following section:

(4) *Shale*, gritty, cover.
(3) COAL ....1 ft. 8 in. to 2 ft. 0 in.
(2) *Fire Clay* ....4 in.
(1) COAL .... 4 in.

This coal, we believe, is of (30) of the *General Section.* The out-cropping of the *Wildsmith*, etc., *seam*, (6) of the above approximate section and (33) of the *General Section*, has been entered by a drift in the S. W. corner of the N. E.¼ of S. 36, T. 20, R 8 W., where it has about the following section:

Out-Cropping in the S. W. corner of the N. E. ¼ of S. 36, T. 20, R. 8 W.

(7) COAL, *Slate* ....8 in.
(2) COAL ....2 ft. 9 in.
(1) *Fire Clay.*

Under some massive sandstones and about thirty feet under this last seam of coal, there is said to be a thin seam of coal from one to two inches thick, it is (5) of the above approximate section ·

Along Mr. Toxey's spring branch, just over the ridge west of the *Dudley Slope*, or in the N. W. ½ of N. W. ¼ of S. 32, T. 21, R. 7 W., there are out-croppings of a seam of coal which is doubtless (2) of the above approximate section or (30) of the *General Section.*

In the N. E. ¼ of S. E. ¼ of S. 36, T. 21, R. 8 W., near Mr. A. M. Kyle's residence and gin house, there are out-croppings, it is believed, of the seam (35) of the *General Section*, which has been drifted into in a good many places. In these drifts the coal is from twenty-four to twenty-six inches thick and is covered for a few feet by shale, which seems to thicken to the north-west, and then by a massive coarse grain friable sandstone. The dip of the coal in these drifts is about three feet in 100 feet to the north-west, though the dip on the out-crop is much greater than this. North-east from the Kyle drifts or beds about one mile are the out-croppings and old diggings which are known as the *Collins' Bed No.* 1. *Collins' Bed No.* 2 is on the out-crop of the same seam about one-half of a mile still farther to the north-east. At the *Collins' Bed No.* 1, there is the following out-cropping:

Out-Cropping at Collins' Bed No. 1,
in the N. W. ¼ *of S. W.* ¼ *of S.* 30, *T.* 21, *R.* 7 *W.*

(6)	*Sandstone*; coarse grain, massive.	
(5)	*Debris*; about	4 ft. 6 in.
(4)	*Shale*	5 ft. 6 in.
(3)	COAL; slaty	6 in.
(2)	*Slate*	1 in.
(1)	COAL; visible	10 in.

This is believed to be of the same seam as the *Kyle beds*, though the latter have not the slate parting (2) of the above section.

The *Clements' Seam* which is thought to be of the same seam as the *Wildsmith Seam* or (33) of the *General Section*, has at its out-cropping in the N. E. ¼ of N. E. ¼ of S. 12, T. 21, R. 8 W., according to Col. N. D. Johnson, the following section:

Out-Cropping of Clements' Seam,
in the N. E. ¼ *of N. E.* ¼ *of S.* 12, *T.* 21, *R.* 8 *W.*

(6)	*Sandstone.*	
(5)	*Shale*	3 ft. 0 in.
(4)	COAL	6 in.
(3)	*Fire Clay.*	4 in.
(2)	COAL	1 ft. 5 in.
(1)	*Fire Clay.*	

The *Wheelock Shaft*, near Clement's Station, or in the S. W. ¼ of S. 1, T. 22, R. 8 W., is likely in (34) of the *General Section*, which is here said to be thirty-nine inches thick and to be excellent coal.

Near the Coaling Station on the Alabama Great Southern Railroad, there has been worked by drifts, the two seams of coal (38) and (40) of the *General Section*, in their out-crops south of the railroad, near and along Lie Branch, in S's 2 and 11, T. 22, R. 8 W. The upper one of these seams, (40) of the *General Section,* in its out-crop in the N. W. ¼ of S. E. ¼ of S. 2, T. 22, R. 8 W., has, according to Col. N. D. Johnson, the following section:

Out-Cropping of the Upper Seam,
in the N. W. ¼ of S. E. ¼ of S. 2, T. 22, R. 8 W.

(7)	*Sandstone.*	
(6)	*Shale*; bluish.	
(5)	COAL; breaking up into little cubes	1 ft. 2 in.
(4)	*Fire Clay*	10 in.
(3)	COAL	1 ft. 9 in.
(2)	*Sandstone*	1 ft. 9 in.
(1)	*Fire Clay.*	

The dip of this coal is said to be about three and one-half feet to the 100 feet to N. 10° W.

About ten feet under this coal, there is a seam of coal about eight inches thick. (39) of the *General Section,* and thirty feet lower, with an intermediate conglomerate, is the seam (38) of the *General Section.* This lowest seam can be seen in many places in its out-crops along the north bank of Lie Branch, in S's 2 and 11, T. 22, R. 8 W. It has been entered by drifts and worked in several places in these out-crops on the north side of Lie Branch, where it has the following sections:

Out-Croppings on Lie Branch,
in the S's 2 and 11, T. 22, R. 8 W.

		1	2
(8)	CONGLOMERATES	35 ft. 0 in.	35 ft. 0 in.
(7)	*Fire Clay*	5½ in.	1 ft. 6 in.
(6)	COAL	1 ft. 2 in.	1 ft. 1 in.
(5)	*Fire Clay*	1 in.	½ in.
(4)	COAL	1 ft. 2 in.	10 in.
(3)	*Fire Clay*	1 in.	3 ft. 0 in.
(2)	COAL	4 in.	9 in.
(1)	*Fire Clay.*		

No. 4 is an average section, as given by Col. N. D. Johnson, of this coal seam within the drifts or away from the out-crop.

No. 2 is a section of the out-crop at the mouth of one of these drifts in the N. E. ¼ of N. W. ¼ of S. 11, T. 22, R. 8 W.

At the mouth of an other one of these drifts about one-fourth of a mile farther down the branch than the one of Section (2) above, or in the S. E. ¼ of N. W. ¼ of S. 11, T. 22, R. 8 W., this seam in its out-crop has the following section:

Out-Cropping on Lie Branch,
in the S. E. ¼ of N. W. ¼ of S. 11, T. 22, R. 8 W.

(12)	*Conglomerate*	35 ft. 0 in.
(11)	*Fire Clay*	1½ in.
(10)	COAL	1 ft. 1 in.
(9)	*Clay Slate*	1½ in.
(8)	COAL	1 ft. 0 in.
(7)	*Slate*	2 in.
(6)	COAL	2 in.
(5)	*Slate*; bluish	4 ft. 8 in.
(4)	COAL	2 in.
(3)	*Slate*	3½ in.
(2)	COAL	4 in.
(1)	*Fire Clay.*	

The coals (2) and (4) of this section do not occur in the other sections that have been given, though doubtless they were present below the floor of the drifts.

About ten feet under this seam of coal, there is said to be an other seam of coal. This seam of coal in its out-croppings on the opposite or south-east side of Lie Branch is said to be nothing more than smut, doubtless due to its being almost on top of the ground or to its weathering.

Farther down Lie Branch, on the north side, there is around Mr. Jolley Jones', in the S. E. ¼ of N. W. ¼ of S. 10, T. 22, R. 8 W., out-croppings of coal from three to four inches thick of several seams. There are also thin out-crops of coal on the south side of Lie Branch, in the S. E. ¼ of S. E. ¼ of S. 10, T. 22, R. 8 W. and at Mr. James Ward's Mill, in the N. W. ¼ of N. W. ¼ of S. 15, T. 22, R. 8 W. At this mill, there seems to be two thin seams of coal; for on the side of the hill and road, there is an out-cropping of coal smut about six inches thick and some six feet below it, in the bottom of the race, there has been found loose coal.

Near Mr. Munroe Smith's, in the N. E. ¼ of S. W. ¼ of S. 22, T. 22, R. 8 W., there is an out-cropping of coal from four to six inches thick, with a cover of hard shale and an underbed of fire clay. This is the most southern out-cropping of coal that is known or have been heard of in the Warrior field, though the measures are said to extend about two miles farther to the south, before they become covered up by a newer formation.

Near Koeppel's Store, in S. 26, T. 21, R. 8 W., the outcrops of the seam (40) of the *General Section*, have been dug and drifted into in several places, in what are known as the *Koeppel Beds.* At the mouth of one of the old drifts, in the N. W. ¼ of S. E. ¼ of S 26, T. 21, R. 8 W., there is the following out-cropping :

Out-Cropping in the N. W. ¼ of S. E. ¼ of S. 26, T. 21, R. 8 W.

(7)	*Sandstone.*	
(6)	*Clay Slate*	1 ft. 6 in.
(5)	Coal ; with slaty parting	9 in.
(4)	*Clay*	1 ft. 2 in.
(3)	Coal	1 ft. 6 in.
(2)	*Sandstones;* coarse grain, hard, grayish blue	10 ft. 0 in.
(1)	Coal	10 in.

In the same *forty* as the above beds, but some 200 yards west of them and some 250 yards still farther west, in an other *forty*, two new drifts have been driven into the outcrops of this seam of coal. In these new drifts, there occur about the following sections :

Sections of Coal Seam in Koeppel's New Drifts, in the N. W. ¼ of S. E. ¼ and of S. E. ¼ of S. W. ¼ of S. 26, T. 21, R. 8 W.

		1	2
(3)	*Sandstone.*		
(7)	*Clay*	0 ft. 0 in.	6 in.
(6)	Coal	3 in.	Coal 11 in.
(5)	*Slate*	1 in.	
(4)	Coal	3 in.	
(3)	*Slate*; clayey	3½ in.	10½ in.
(2)	Coal	4 in.	1 ft. 1½ in.
(1)	*Fire Clay*	1 ft. 0 in.	2 ft. 0 in.

No. 1, is a section of the seam in the most western of these new drifts, or the one in the N. W. ¼ of S. E. ¼ of S. 26, T. 21, R. 8 W. *No.* 2, is a section of the seam in the other new drift, which is in the S. E. ¼ of S. W. ¼ of S. 26, T. 21, R. 8 W. The dip of this coal on the out-crop is from fifteen to twenty feet in one-fourth of a mile to the WSW. In section (2) the clay parting and both benches of the coal are variable, and in one place the seam suddenly drops three feet without breaking. This coal contains considerable iron pyrites.

Some 250 yards west of the most western of the above new drifts, there is an out-cropping of coal from three inches to twelve inches in thickness. This coal is believed to be of the *upper group* of the seam of the *Koeppel Beds*, which has here split up. Some fifty to sixty yards north of this last coal out-cropping, or in the S. W. ¼ of S. W. ¼ of S. 26, T. 21, R. 8 W., and not much under the last coal out-cropping, there is an out-cropping of good coal, from twelve to fourteen inches thick, that has been known of for a long time and has been considerably surface dug. It has a cover of a slaty fossiliferous sandstone and is of the lower bench or group of the seam of the *Koeppel Beds* or (40) of the *General Section.* North of this last coal out-cropping about one-fourth of a mile or in the N. W. ¼ of S. W. ¼ of S. 26, T. 21, R. 8 W., and some ten feet higher, there is the following out-cropping:

Out-Cropping in the N. W. ¼ of S. W. ¼ of S. 26, T. 21, R. 8 W.

(3) *Conglomerate*; a little slabby.
(2) COAL.... ....10 in.
(1) *Shale.*

This coal is believed to be of the *upper bench* of (38) of the *General Section.*

Still farther north some 300 yards, in the S. W. ¼ of N. W. ¼ of S. 26, T. 21, R. 8 W., there is an out cropping of coal which is perhaps of the same seam as the last. Still farther to the north, there is an other out-cropping of coal, which is probably of a higher seam, (40) of the *General Section.* West of this last coal out-cropping some seventy-five yards, there is an out-cropping of a coal seam that is thirty to forty feet lower. It is of (38) of the *General Section.* The following is an approximate section of the coal out-crops in S's 26 and 27, T. 21, R. 8 W.:

Approximate Section of Coal Out-Crops in S's 26 and 27, T. 21, R. 8 W.

(5)	COAL; (41) of the *General Section.*	
	Measures	25 ft. 0 in.
(4)	COAL; from	9 in to 1 ft. 2 in.
	Measures	3 in. to 8 ft. 0 in.
	COAL; *Diamond Prospect Mines*	12 to 1 ft. 9 in.
	Measures	10 ft. 0 in.
(3)	COAL	10 in.
	Measures, Conglomerates	20 to 30 ft. 0 in.
(2)	COAL; on Lie Branch	1 ft. 11 in. to 2 ft. 10 in.
	Measures; with streaks of coal	8 ft. 0 in.
(1)	COAL	2 in. to 0 ft. 9 in.
	Measures.	

These coals correspond to the coals from (37) to (41), inclusive, of the *General Section.* The *Koeppel Seam* and *Johnson's upper Seam* are (5) of the above section, all together.

On Koeppel Creek, in the S. E. ¼ of N. E. ¼ of S. 26, T. 21, R. 8 W., there are the following out-crops:

Out-Croppings on Koeppel Creek, in the S. E. ¼ of N. E. ¼ of S. 27, T. 21, R. 8 W.

		1	2
(4)	CONGLOMERATES; bluff		15 ft. 0 in.
(3)	*Slate*; fossiliferous	6 in.	3 in.
(2)	COAL	1 ft. 0 in.	1 ft. 2 in.
(1)	*Fire Clay*; hard.		

This coal is the *upper bench* of the coal (2) of the above approximate section. The conglomerate (4) of this last section is carbonaceous and micaceous and its pebbles are all small; the slate (3) is hard and fossiliferous and the coal (3) contains streaks of mineral charaoal. The coal of *Section*

(1) is in the back part of a rock house and under the waterfall of a small branch; the out-cropping of *Section* (2) is in the same *forty* as that of *Section* (1), but about 200 yards south-west of it, on the east bank of Koeppel Creek.

At the *Diamond Prospect Mines* (Weaver Mines) in the S. E. ¼ of N. W. ¼ and S. W. ¼ of N. E. ¼ of S. 27,, T. 21, R. 8 W., there is the following section:

Out-Cropping at "Diamond Prospect Mines,"
in the S. E. ¼ of N. W. ¼ and S. W. ¼ of N. E. ¼ of S. 27, T. 21, R. 8 W.

(6)	*Sandstones.*	
(5)	COAL SMUT	10 in.
(4)	*Slate*; fossiliferous; it contains sheets of COAL	6 ft. 0 in.
(3)	COAL; good and hard; it has some pyrites along its top	1 ft. 6 in. to 1 ft. 8 in.
(2)	*Slate*; about	¾ in.
(1)	*Sandstone.*	

The coal of these mines, (3) of the above section, is the *under bench* of the *Koeppel seam* and the Johnson upper seam (40) of the *General Section.* It has a dip of about eighteen inches in 100 feet to the north-west.

Under a bluff of massive conglomerates on Big Hurricane Creek, just over the bridge, in the S. W. ¼ of S. 18, T. 21, R. 7. W., there is said to be an out-cropping of coal about twelve inches thick, it is of the *upper bench* of (38) of the *General Section* or of the same coal as crops out along Koeppel Creek, in the S. E. ¼ of N. E. ¼ of S. 27, T. 21 R. 8 W.

In the fork of Big and Little Hurricane creeks, in the S. E. ¼ of S. W. ¼ of S. 13, T. 21, R. 8 W., there is an old ditch or trench in which there are growing large trees and which has been known of ever since the first settlement of the country; it is believed by the natives to be of an old earth-work or fortification.

In the N. E. ¼ of N. E. ¼ of S. 12, T. 21, R. 8 W., there is on a branch an out-cropping of coal ten and a-half inches thick with an underbed of fossiliferous slate and a cover of slabby and slaty sandstone. The dip of this coal is seemingly 4° to 5° to the north-east. Just down the branch from this coal out-cropping, there is said to be a showing of an other seam of coal, and up the branch from the above out-cropping of ten and a-half inches of coal, north about one-quarter of a mile and at least twenty feet higher, there are some old coal pits from which much coal has been raised. Still farther up the branch, north-east about fifty yards and six to eight feet higher, there is an out-cropping of very hard coal, visible to a thickness of about nineteen inches, with a gritty fossiliferous slate underbed and a cover of a a coarse grain, slabby sandstone of a yellowish gray color. The coal of the above old pits is likely of this same seam. The above out-croppings of coal are doubtless of (43) to (45), inclusive, of the *General Section.* Farther to the north and west than the above coal out-cropping, there are on the branches and in the ravines of the S. E. ¼ of S. E. ¼ of S. 1, and N. E. ¼ of N. E. ¼ of S. 12, T. 21, R. 8 W., numerous out-croppings of the coals from (46) to (50), inclusive, of the *General Section.*

At the *Lawrence Bed No. 1,* in the S. E. ¼ of S. W. ¼ of S. 1, T. 21, R. 8 W., there is the following out-cropping:

Out-Cropping at the "Lawrence Coal Bed No. 1," in the S. E. ¼ of S. W. ¼ of S. 1, T. 21, R. 8 W.

(12) *Debris;* likely covers some *coal.*	
(11) *Clay;* visible	1 ft. 0 in.
(10) COAL	7½ in.
(9) *Clay Slate*	5½ in.
(8) COAL	6 in.
(7) COAL, *Slate;* in alternate streaks	8 in.
(6) COAL; about	11 in.
(3) COAL, *Slate;* in alternate streaks	5 in.
(4) *Fire Clay* or *Clay Slate;* parting	10 ft. 0 fn.
(3) COAL; good and hard; with regular *face and butt structure* and containing considerable *iron pyrites;* visible 18 inches in thickness, said to be	2 ft. 0 in.
(2) *Shale;* grayish, reported	2 in.
(1) COAL; reported to be	1 ft. 0 in.

The coals of this out-cropping are doubtless of (50) of the *General Section.* The *Lawrence Bed No.* 2 is about one-half mile south-east of the *Lawrence Bed No.* 1, and is believed to be in the seam of coal, (49) of the *General Section.*

About one-half mile south-west of the *Lawrence bed No.* 1, or in the S. E. ¼ of S. E. ¼ of S. 2, T. 21, R. 8 W., and some fifty feet lower, there is the following out-cropping of the coal seam (47) of the *General Section* :

Out-Croppings in the S. E. ¼ of S. E. ¼ of S. 2, T. 21, R. 8 W.

(14)	*Conglomerate*; in places it is massive with the pebbles all through it; in other places it is divided up into seams with pebbles in streaks; about	5 ft. 0 in.
(13)	*Clay Slate;* with streaks of Coal	5½ in.
(12)	Coal; soft, much weathered	9 in.
(11)	*Clay Slate;* with a streak of Coal	8 in.
(10)	Coal; slaty	5 in.
(9)	Coal; good	7 in.
(8)	*Mother of Coal*	1½ in.
(7)	Coal; slaty	5 in.
(6)	*Slate,* Coal; in alternate streaks	4 in.
(5)	Coal	1 in.
(4)	*Slate*; hard, dark grayish color	1 in.
(3)	Coal	11½ in.
(2)	*Fire Clay*	5 in.
(1)	*Shale*; hard.	

This same seam crops out again about seventy-five yards farther up the branch, to the NEN.

South-west of the out-cropping of the above section about eighty yards, there is in the back part of a rock-house an out-cropping of coal that is of a seam some twenty feet lower than that of the above section. This out-cropping is as follows:

Out-Cropping in the S. E. ¼ of S. E. ¼ of S. 2, T. 21, R. 8 W.

(4)	*Sandstone*; coarse grain, cover to rock-house	8 ft. 0 in.
(3)	*Shale*; forming back of rock-house	7 ft. 0 in.
(2)	Coal; about	1 ft. 0 in.
(1)	*Slate*; may be a parting.	

This out-cropping has a dip of about 5° to 10° N.

N. W. of this rock-house about fifty yards, there are some old coal pits which are doubtless down on this same seam, (46) of the *General Section*. About 100 yards still farther to the north-west, there is the following out-cropping of coal which is believed to be of the next higher seam or (47) of the *General Section*:

Out-Cropping
in the S. E. ¼ of S. E. ¼ of S. 2, T. 21, R. 8 W.

(13)	***Debris.***	
(12)	***Shale***; hard	6 ft. 0 in.
(11)	***Black Bituminous Shale***	2 in.
(10)	COAL; cubical	1 in.
(9)	***Slate***	1½ in.
(8)	COAL	3 in.
(7)	***Slate***	½ in.
(6)	COAL	3 in.
(5)	***Slate***	½ in.
(4)	COAL	5 in.
(3)	***Slate***	1 in.
(2)	COAL	4 in.
(1)	***Fire Clay***; visible	8 in.

Farther east than any of the above outcroppings, there is on a branch in the S. W. ¼ of N. W. ¼ of S. 6, T. 21, R. 7 W., the following out-cropping:

Out-Cropping
in the S. W. ¼ of N. W. ¼ of S. 6, T. 21, R. 7 W.

(5)	***Sandstone;*** slabby and massive, about	30 ft. 0 in.
(4)	***Shale;*** gritty and hard	1 ft. 8 in.
(3)	COAL; very hard, little slaty on top	11 in.
(2)	***Slate***, COAL; in alternate streaks	4 in.
(1)	***Shale;*** hard and fossiliferous, and of a bluish color.	

This coal is likely (46) of the *General Section*. In this out-cropping the strata are in waves from N. E. to S. W., though the general dip seems to be to the north-east. Up the branch, NWN. from this out-cropping about one-half mile and fifty feet or more higher, there are several out-croppings of a seam of coal that is reported to be about two feet six inches thick. It is likely (49) of the *General Section*. Still farther up the branch and some twenty-five feet or more higher there is a strong chalybeate spring which more than probably rises in the out-cropping of (50) of the *General Section.*

At the *Hamer Bed,* in the N. W. ¼ of N. W. ¼ of S. 1, T. 21, R. 8 W., the coal (50) of the *General Section,* has the following out-crop:

Out-Cropping at the Hamer Coal Bed.
in the N. W. ¼ of N. W. ¼ of S. 1, T. 21, R. 8 W.

(10)	*Conglomerate;* a coarse grain rock, of an orange color with flint pebbles, many of them black, scattered all through it, visible to a thickness of	3 ft. 0 in.
(9)	*Slate*	3 ft. 6 in. to 4 ft. 0 in.
(8)	COAL; little slaty on top	8½ in.
(7)	COAL *Slate*; in alternate streaks	8 in.
(6)	COAL; good	8 in.
(5)	*Slate*	1 in.
(4)	COAL	7½ in.
(3)	*Slate*; grayish blue	¼ in.
(2)	COAL	11½ in.
(1)	*Slate.*	

This coal is doubtless of (50) of the *General Section*; it is believed to be in waves from north-east to south-west. Considerable coal has been raised from this out-cropping.

Down the branch, south from the Hamer Bed about 400 yards and some ten feet lower, thre is an out-cropping of a seam of coal that is said to be two feet two inches thick. It is of (49) of the *General Section.* This coal crops out and has been dug at in a great many places in this neighborhood; it is a hard coal and has an excellent reputation as a shop coal.

The *Peterson or Farish Coal Bed* is about one-half of a mile WSW. of the *Hamer Bed* or is in the S. W. corner of N. W. ¼ of S. 2, T. 21, R. 8 W. It is said to have been on the out-crop only two feet two inches thick, but that on being dug into it thickened up to about forty-three inches, with a little slate near the center. This out-cropping is of the same seam as the *Hamer Bed* or (50) of the *General Section,* and has a dip of between twelve and fifteen feet in the mile to the north-west.

The *Garland Beds*, in the N. W. ¼ of N. E. ¼ of S. 2, T. 21, R. 8 W., are in the out-croppings of (49) of the *General Section*. The coal in these beds is said to be about two feet thick and is of a very fine quality.

In the N. E. ¼ of N. W. ¼ of S. 35, T. 20, R. 8 W., there is a mound some twenty-five feet in diameter and three feet high. On this mound, when first discovered, there is said to have been standing near the center a post with a tomahawk sticking in it, and on the mound there are now several sunken places, which more than likely are over graves.

In the S. E. ¼ of S. 3, T. 21, R. 8 W., there are numerous old coal pits in the out-croppings of a seam of coal that is said to be about two feet thick; and in the S. W. ¼ of S. 11, T. 21, R. 8 W., there are out-croppings of a seam of coal, with slaty partings, that is said to be about four feet thick. This coal has also been considerably surface dug. These coals are likely of (49) and (43) of the *General Section*.

In the S. W. corner of S. 4, T. 21, R. 8 W., is the coal out-cropping that is known as the *Maxwell Bed*. The coal out-cropping at the *Maxwell Bed* is reported to be as follows:

Coal Out-Cropping at the Maxwell Bed,"
in the S. W. corner of S. 4, T. 21, R. 8 W.

(7)	*Shales*; of a bluish color, cover.	
(6)	COAL	1 ft. 2½ in.
(5)	*Clay*; plastic	1 ft. 3 in.
(4)	COAL	2 ft. 0 in.
(3)	*Slate*; hard, bluish	1 in.
(2)	COAL	1 ft. 0 in.
(1)	*Slate*.	

This coal is of (50) of the *General Section*. It crops out near the heads of all the hollows, in the S. E. ¼ of S. 5, T. 21, R. 8 W., from under the conglomerate that shows near the heads of all the hollows and ravines around Mr. Alonzo Scales, in the N. W. ¼ of N. E. ¼ of S. 8, T. 21, R. 8 W. In the S. W. ¼ of N. E. ¼ of S. 8, T. 21, R. 8 W., there was noticed the smut of two seams of coal; one just under the above conglomerate and the other some forty feet lower, though about 100 feet above Hurricane Creek, These coal out-croppings are doubtless of (50) and (48) of the *General Section.* On the Goree Coal Bed Branch, in the S. W. ¼ of N. E. ¼ of S. 7, T. 21, R. 8 W., the is, in the back part of a rock house, an out-cropping of a seam of block coal twelve inches thick, that has a clay slate underbed and for a cover a slabby micaceous sandstone of a yellowish gray color. This out-cropping appears to dip 4° to 5° to the north-east. This same seam of coal, (46) of the *General Section,* crops out also about one mile WSW. of the above out-cropping or on Ruhamy Church Spring Branch, in the S. W. ¼ of N. W. ¼ of S. 7, T. 21, R. 8 W. In these out-croppings, it is also in the back part of rock houses and is under a bluff of slabby and massive sandstone from twenty to twenty-five feet high. Up this spring branch, to the north-west some 300 yards and about twenty-five feet higher than the above out-cropping of coal, there are numerous old coal pits into the out-crop of a seam of coal that is covered by a hard bluish shale. This coal out-cropping is probably of (48) of the *General Section.* Still farther up this spring branch to the NWN. some 200 yards and at least fifty feet higher than the above old coal pits, there is an out-cropping of an other seam of coal that is likely (53) of the *General Section.* This same seam of coal also crops out about one-half of a mile south-west of the *Goree Coal Bed No. 1,* or in the S. W. ¼ of S. W. ¼ of S. 6, T. 21, R. 8 W.

The *Goree Coal Bed No.* 1, in the N. W. ¼ of S. E. ¼ of S. 6, T. 21, R. 8 W., is in an out-cropping of the coal (50) of the *General Section,* which, according to Mr. Wm. Riley, has the following section:

Section of Coal Out-Cropping in "Goree Bed No. 1," *in the N. W.* ¼ *of S. E.* ¼ *of S.* 6, *T.* 21, *R.* 8 *W.*

(9)	*Debris*; gravels and sand.	
(8)	*Clay*; reddish	3 ft 0 in.
(7)	*Clay Slate*; bluish	1 ft. 0 in.
(6)	COAL	1 ft. to 1 ft. 1 in.
(5)	*Slate*	2 in.
(4)	COAL	1 ft. 2 in.
(3)	*Slate*	1 in.
(2)	COAL	1 ft. 0 in.
(1)	*Slate.*	

The strata at this out-cropping dip to the south-west.

On each side of the *old plank road* along the top of the divide between the waters of Hurricane Creek and the river, in the neighborhood of Jemison's old steam mill, in S. 32, T. 20, R. 8 W., there are visible out-crops of coal in the head of almost every hollow or ravine. These out-crops are of the coals from (50) to (43), inclusive, of the *General Section.* Most of these out-crops have been dug into and from many of them considerable coal was raised previous to the building of the Alabama Great Southern Railroad or when coal was a commodity for the natives whenever they went to Tuscaloosa.

In three to four different hollows in the N. W. ¼ of N. W. ¼ of S. 5, T. 21, R. 8 W., there are old pits and drifts which are called the *Jemison Coal Beds.* These old pits and drifts are in the out-crops of (50) of the *General Section,* which is said to have here the following section :

Out-Cropping at the "Jemison Coal Beds,"
in N. W. ¼ of N. W. ¼ of S. 5, T. 21, R. 7 W.

(8)	*Conglomerate ;* ferruginous, visible to a thickness of	3 in. to 0 ft. 4 in.
(7)	*Clay* ; plastic reddish	3 in.
(6)	COAL ; increasing in thicknes as gone into	10 in.
(5)	*Slate*	1 in.
(4)	COAL	1 ft. 6 in
(3)	*Slate*	1½ in.
(2)	COAL	1 ft. 0 in.
(1)	*Slate;* bluish.	

This coal has a regular *face and butt* structure and seams to dip to the north-east. Much coal has been taken from these old pits and drifts, most of which was hauled in wagons, one and a-half miles, to the river and loaded on flat boats and floated to Mobile. A good deal of this coal is said to have undergone the novel process of being boxed up, as it was mined, for shipment, the boxes having been conveniently and cheaply made at the steam saw mill, which was not far off.

Just west of the *Jemison beds,* in the out-crops of the same seam of coal, there are the old pits which are called the *Snider Coal Beds.* At the *Snider beds,* the strata appear to dip to the south-west. The *Bankston and Jemison beds* are in the out-crops of this same coal seam in the N. E. ¼ of N. E. ¼ of S. 6, T. 21, R. 8 W. The coal in the weathered out-crops of these beds breaks up in long stringy pieces and is said to be three feet thick.

On the John Snider's spring branch, in the N. E. ¼ of N. W. ¼ of S. 5, T. 21, R. 8 W., there is an out-cropping of coal which is some twenty-two feet below those of the Jemison, etc., coal beds; it is covered by a massive, coarse grain. carbonaceous sandstone of a yellowish gray color and is doubtless of (49) of the *General Section.*

In numerous places in the southern part of S. 32, T. 21, R. 8 W., there are pits into the out-crops of (50) of the *General Section.* The seam under this one or (49) of the *General Section* crops out in the N. W. ¼ of S. E. ¼ of S 32, T. 20, R. 8 W. A still lower seam by some twenty-five feet, (48) of the *General Section,* crops out in the N. W. ¼ of S. W. ¼ of S. 33, T. 20, R. 8 W., where it is about three feet thick. In these out-crops, this seam is in waves from N. E. to S. W., though the general dip seems to be 4° to 5° to the S. W. North-east of these out-croppings some 200 yards and some fifteen feet above them, there is an other coal outcropping which may be of this same seam. In the shale just over this last coal out-cropping, there are nodules or balls of *clay iron stone,* that are called *bull eyes,* and just over this shale, which is six to eight feet thick, there is a massive micaceous gray sandstone with fossil leaf and stem impressions. This rock very likely in places contains considerable carbonate of lime or is an impure limestone.

In the N. W. ¼ of N. W. ¼ of S. 4, T. 21, R. 8 W., there are out-croppings of a seam of good and hard coal which is three feet thick and is likely of this same seam, (48) of the *General Section.*

In the S. E. ¼ of S. E. ¼ of S. 32, T. 20, R. 8 W., on the side of the Steam Mill spring branch, there is an out-cropping of coal from twelve to fifteen inches thick which is probably of (49) of the *General Section.* This coal appeared to be thickening as gone into and is a good, hard, cubical coal; it is said to coke well and to be an excellent shop coal. It has a slate underbed which is full of stem and leaf impressions and a dip of 4° to 5° to the north-west.

About 100 yards up the branch or north-east of the last coal out-cropping, and some ten feet lower, this same seam shows itself again. Still farther up the branch, to the north about 150 yards, at the site of the old steam mill, in the N. W. ¼ of S. W. ¼ of S. 33, T. 20, R. 8 W., and some eighteen to twenty feet above the last out-cropping of coal, there are some coal pits and drifts into the out-crops of (50) of the *General Section.* From twenty to forty feet above these out-croppings of coal, in the gullies between the old mill and the plank road, there is much ferruginous conglomerate with a stratum of light colored clay just over it; it is believed to be of the Coal Measures, though it may be of the Drift.

Over the divide, on the north side of the old plank road and about one-quarter of a mile north of the old steam mill, there are along a branch in the S. W. ¼ of N. W. ¼ of S. 33, T. 20, R. 8 W., in the out-cropping of (50) of the *General Section,* numerous old pits and several old drifts, which are also called the *Jemison Beds.* The coal of these old *diggings* has a flaggy or *face and butt* structure and breaks up in long stringy pieces.

On the waters of Brush Creek, in the S. W. ¼ of S. W. ¼ of S. 28, T. 20, R. 8 W., there are some coal pits in the out-croppings of (47) of the *General Section,* and on the side of the hill above the pits from six to eight feet and sixty to seventy feet there are out-croppings of ferruginous conglomerates. About one-half of a mile south-west of these old pits or on Rocky Branch, one of the head prongs of Big Branch, in the N. E. ¼ of S. 32, T. 20, R. 8 W., and some thirty-five to forty feet higher than the above old coal pits, there are out-croppings of a seam of coal which is likely of (48) of the *General Section.* Down the branch or still farther to the south-west about one-fourth of a mile and from forty to forty-five feet lower, there are other out-croppings of coal which doubtless belong to (47) of the *General Section.*

The coal of these out-croppings also breaks up in long stringy pieces. A few feet under the last mentioned coal out-croppings or the out-croppings of (47) of the *General Section,* there sets in a hard sandstone of a yellowish gray color and thence on down to the river the branches are very rocky and have many water-falls and high perpendicular bluffs along them, and the country is very broken and rugged with but few visible out-crops of coal.

In the Eddin's road, near Mr. E. Burchfield, in the N. W. ¼ of N. E. ¼ of S. 33, T. 30, R. 8 W., there is a thin out-cropping of coal smut which is probably of (53) of the *General Section.*

Along a branch in the S. E. ¼ of S. W. ¼ of S. 20, T. 20, R. 8 W., there are the out-croppings of two seams of coal which are separated by from fifteen to sixteen feet of strata. The lower of these coals is a *block coal* and was visible to a thickness of about eight inches. These two coal out-crops are believed to be of (39) and (40) of the *General Section.*

About one-fourth of a mile SWS. of these out-croppings, or on Dauthy's Spring Branch in the N. E. ¼ of N. W. ¼ of S. 29, T. 20, R. 8 W., there is a showing of coal, which is likely of one or the other of the above seams. The coal was visible to a thickness of only six inches, but showed plainly its flaggy or *face and butt* structure.

Over this last out-cropping of coal, there is about 130 feet of strata, principally of shales, to a capping of massive sandstone. Under this massive sandstone, there is said to be a seam of coal about eight inches thick. It is likely of (44) of the *General Section.* There is, however, some coal in these 130 feet of strata or between the coal seams under the capping of sandstone and in Douthy's Spring Branch, for in the N. E. ¼ of N. W. ¼ of S. 30, T. 20, R. 7 W., there is a showing of coal smut which is not more than twenty-five feet above the coal on Douthy's Spring Branch. This coal smut is probably of the *University seam,* (43) of the *General Section.*

There are reported out-crops of coal in Douthy's Spring Branch, near its mouth, in the S. W. ¼ of S. E. ¼ of S. 19, T. 20, R. 8 W., and in the river just below the Langston

Shoals, in the S. W. ¼ of S. W. ¼ of S. 29, T. 20, R. 8 W., and near the head of these shoals, in the N. W. ¼ of S. E. ¼ of S. 29, T. 20, R. 8 W. These out-croppings are thought to be about four feet in thickness and are believed to be of one and the same seam, (38) of the *General Section.*

On Brush Creek about one-half of a mile from its mouth or in the N. E. ¼ of S. E. ¼ of S. 29, T. 20, R. 8 W., there is a reported out-cropping of coal about eighteen inches thick; it is believed to be of (39) or (40) of the *General Section.*

In the river just below Arnold's Shoals, or in the S. W. ¼ of S. W. ¼ of S. 30, T. 20, R. 8 W., there is an out-cropping of coal which is reported to be from three to four feet thick. Boat loads of coal have been raised from this out-cropping and it is pronounced a very fine coking coal that has no superior on the river, Some ninety feet above this last out-cropping of coal, there is, on the side of the hill in the field near Mr. Willis Scales, about the center of the S. W. ¼ of S. 30, T. 20, R. 8 W., a showing of coal smut six inches thick with an underbed of fire clay. These two last out-croppings of coal are believed to be of (39) and (44) of the *General Section.*

In the river just below the Snider Shoals, or in the S. E. ¼ of N. E. ¼ of S. 25, T. 20, R. 9 W., there is said to be an out-cropping of coal from two to three feet thick and that some 100 yards farther down the river and seemingly five to six feet lower than this last coal, there is a reported out-cropping of coal eighteen inches thick. The coal of this lower out-cropping, it is said, breaks up in large lumps and from it boat loads of coal have been raised. These two coal out-croppings are believed to be of one and the same seam (40) of the *General Section.*

On Big Branch, in the S. E. ¼ of S. E. ¼ of S. 30, T. 20, R. 8 W., there is a wild, grand and picturesque sight. This branch, whilst running almost due west is suddenly deflected to the north and immediately precipitated down a bluff or steep incline at an angle of about 45° and a perpendicular height of about fifty feet. Striking against a wall or bluff at the bottom, the branch is turned suddenly back to its former westward course to be again precipitated down an other steep incline or fall. The rocks of these falls are a gritty shale of a dark color. In the deep ravine below these falls, there are many specimens of noble poplars, from four to five feet through. There is also in the deep ravines of this wild and broken country near the river, between Hurricane and Daniel Creeks, much fine timber of white and chestnut oaks. Some of these chestnut oaks are from three feet six inches to four feet through and would yield, at the least, two tons of tan bark to the tree. This bark is not only thicker than the bark of the red and black oaks, but is also much better suited for tanning; it is said to be worth about $6.00 per cord. There is also in spots over some of these bluffs, a considerable growth of red cedar, among which there is an occasional tree of as much as two feet in thickness.

The *Manley Coal Bed* is an out-cropping of (47) of the *General Section*, in the N. W. ¼ of N. E. ¼ of S. 1, T. 21, R. 9 W. It is some ninety feet above low water in the river and over 150 feet below the general level of the country. The coal of this bed is from fifteen to sixteen inches thick; it has an underbed of fire clay and a cover for fourteen to twenty inches in thickness of a hard fossiliferous bluish shale and then a massive and slabby, carbonaceous coarse grain sandstone of a dark gray color for thirty to forty feet. This sandstone cover is a conglomerate in places. The coal of this bed has an excellent reputation as a shop coal; it is a very hard coal, as well as a very pure coal as shown by the following analysis of an average sample of the whole thickness on the out-crop:

Specific Gravity	1.277
Sulphur	.752
Moisture	2.004
Volatile Matter	33.833
Fixed Carbon	61.872
Ash	2.291
	100.000

Up the branch, to the south-east about one-quarter of a mile, in the S. E. ¼ of N. E. ¼ of S. 1, T. 21, R. 9 W., near the fork of Dry Bridge and Toll Gate branches and some thirty feet higher than the *Manley bed*, there is an out-cropping of the coal (48) of the *General Section.*

Up Dry Bridge Branch, about 500 yards south-east of the last coal out-cropping and some thirty feet above it, are the *Goree Mines No.* 1, in the out-cropping of (50) of the *General Section.* The *Goree mines* are distinguished from the *Goree beds*, in that the former are *drifts*, whereas the latter are merely *surface diggings.*

At the *Goree Mines No. 1*, in the S. W. ¼ of N. W. ¼ of S. 6, T. 21, R. 8 W., there is the following out-cropping at two different places:

Out-Croppings at the "Goree Mines No. 1,"
in the S. W. ¼ of N. W. ¼ of S. 6, T. 21, R. 8 W.

		(1)	(2)
(8)	*Sandstones*	10 ft. 0 in.	10 ft. 0 in.
(7)	*Clay Slate*	0 0	1½ in.
(6)	COAL; much weathered, shaly	5½ in.	7 in.
(5)	*Black Slate*	¼ in.	¼ in.
(4)	COAL	11 in.	9 in.
(3)	*Clay Slate*	½ in.	¼ in.
(2)	COAL	1 ft. 3½ in.	1 ft. 3 in.
(1)	*Slate.*		

This is a pure coal; it breaks out in cubical blocks and has a dip of 4° to 5° to the north-west.

On the side of the ridge, some thirty feet above those out-croppings, there are some ferruginous conglomerates which are doubtless of those over (50) of the *General Section.*

To the east of *Goree Mines No. 1* about one-quarter of a mile, on Toll Gate Branch in the N. E. ¼ of S. W. ¼ of S. 6, T. 15, R. 8 W., are the *Goree Mines No.* 2, which are in the same coal seam as the *Goree Mines No. 1.* The coverings over these old drifts had fallen in so badly that a good section could not be gotten of the coal out-cropping, though in a drainage channel leading from one of the drifts, the coal smut is about as follows:

Out-Cropping at "Goree Mines No. 2,"
in the N. E. ¼ of S. W. ¼ of S. 6, T. 21, R. 8 W.

(10)	*Debris.*	
(9)	*Clay Slate;* with coal smut in streaks.	
(8)	COAL; little slaty at the bottom	5 in.
(7)	*Clay Slate*	1 ft. 7 in.
(6)	COAL; bony	6½ in.
(5)	*Black Slate*	½ in.
(4)	COAL	10 in.
(3)	*Black Slate*	1½ in.
(2)	COAL	1 ft. 3 in.
(1)	*Slate;* fossiliferous.	

On the side of the ridge from ten to fifteen feet above these coal out-croppings, there are some ferruginous conglomerates.

Up the branch to the south-east about one-quarter of a mile, in the N. W. ¼ of N. E. ¼ of S. 6, T. 21, R. 8 W., or about 150 yards down the branch to the north-east from the old Toll Gate spring, there are some old coal pits into the out-croppings of this same seam of coal, (50) of the *General Section.*

The *Boyd Mines No. 1* consist in a series of old drifts in the out-croppings, we believe of (49) of the *General Section,* around a ridge in the S. E. ¼ of S. 1, T. 21, R. 9 W. Some fifteen feet above these old drifts and just above the Boyd spring in the N. E. ¼ of S. E. ¼ of S. 1, T. 21, R. 9 W., there are some ferruginous conglomerates which are doubtless of those just over (50) of the *General Section.* The coal of the *Boyd Mines No. 1* is said to be about two feet six inches thick. Just above this coal a few feet is a massive sandstone of yellowish and grayish colors.

The *Ash and Ward Mines,* consist of a series of drifts in a deep ravine in the N. W. ¼ of S. E. ¼ of S. 1, T. 21, R. 9 W. These drifts are in the out-croppings of (47) of the *General Section* and are some seventy-five feet below the *Boyd Mines No. 1,* about 130 feet below the level of the surrounding country and seventy-five to eighty feet above low water in the river. At these mines the following sections have been taken :

Sections at the "Ash and Ward Mines," in the N. W. ¼ of S. E. ¼ of S. 1, T. 21, R. 9 W.

		(1)	(2)	(3)
(9)	*Conglomerate*	3 ft. 0 in.	3 ft. 0 in.	
(8)	*Clay Slate*	3 in.	*Clay Slate*. 10 in.	
(7)	*Bituminous Shale*	1 in.		
(6)	*Clay Slate*	3 in.		
(5)	COAL	2 in.	¾ in.	8 in.
(4)	*Slate*	8 in.	1 in.	2 in.
(3)	COAL	2 in.	1½ in.	6 in.
(2)	*Slate*	8 in.	10 in.	2 in.
(1)	COAL	2 ft. 0 in.	2 ft. 0 in.	1 ft. 6 in.

Section (1) occurs in the Geological Report for 1879-1880 and *Section* (5) was given by a Mr. Boyd who has done considerable work in these mines. In the case of *Section* (2), the coal (1) was seen to a thickness of one foot three inches and felt down to a thickness of two feet without being able to reach the bottom.

The *Dougan Mines* are old surface diggings which are some 500 yards north-east of the "Ward and Ash Drifts" and about fifteen feet above them. The coal of these old diggings is covered by hard massive shales and sandstones and must be of (48) of the *General Section.*

The *University or Blocker Mines* are a series of drifts near the center of the N. E. ¼ of S. 2, T. 21, R. 9 W. They are in the out-croppings of (43) of the *General Section,* and are about fifty feet below the Ash and Ward mines and twenty-five to thirty feet above low water in the river. The following are sections of the seam of coal in these drifts:

Sections of Coal Seam in the "University or Blocker Mines," near the center of the N. E. ¼ of S. 2, T. 21, R. 9 W.

		(1)	(2)	(3)
(13)	*Shale*	20 ft. 0 in.	20 ft. in.	20 ft. 0 in.
(12)	COAL	1½ in.	0 in.	0 in.
(11)	*Clay Slate*	1 in.	0 in.	0 in.
(10)	COAL; cubical	8 in.	8 in.	10 in.
(9)	*Black Slate*	4 in.	1 in.	¾ in.
(8)	COAL; cubical		1¼ in.	1 in.
(7)	*Blcak Slate*		2 in.	2 in.
(6)	COAL	3⅛ in.	2⅛ in.	3⅛ in.

(5)	*Slate*; hard	7 in.	11½ in.	8 in.
(4)	COAL; good	10¼ in.	10½ in.	9 in
(3)	*Black Slate*; hard	5½ in.	5 in.	3 in.
(2)	COAL; good	12 in.	11¼ in.	9 in.
(1)	*Slate*; hard, with coal streaks.			

Sections (1) and (2) occur at two different points within these mines and *Section* (3) can be found in the Geological Report for 1879-1880. The following analysis is of an average sample of the full thickness of this seam of coal, less the slate partings, as is in *Section* (3) *above*:

Specific gravity	1,298
Sulphur	1,038
Moisture	1,833
Volatile Matter	36,233
Fixed Carbon	54,534
Ash	7,400
	100,000

In these mines the coal seam has a dip to the south-west and the mines are perfectly dry except near the mouths of the drifts. They are below the high water mark and hence are flooded during high stages of the river.

This seam, (43) of the *General Section*, has a *lower bench* from which the *upper group*, as given in the above sections of the seam in the University Mines, splits off and is here separated from it by fifteen feet or more of strata. The thin seam of coal that is said to crop out near the level of low water in the river, just below Ward Shoals, is doubtless of this *lower bench*. This out-cropping of coal just below Ward Shoals is reported to be ten inches thick.

At the *Dafford Mine* in the N. E. ¼ of N. E. ¼ of S. 11, T. 21, R. 9 W., there is the following out-cropping:

Out-Cropping at the "Dafford Mines," in the N. E. ¼ of N. E. ¼ of S. 11, *T.* 21, *R.* 9 *W.*

(13)	*Conglomerate*; full of pebbles	3 ft. 0 in.
(12)	*Sandstones*; micaceous, yellowish gray	7 ft. 0 in.
(11)	*Slate*; soft	1 ft. 6 in.
(10)	COAL	4 in.

(9)	*Slate*	¼ in.
(8)	COAL	2 in.
(7)	*Slate*	½ in.
(6)	COAL	9 in.
(5)	*Slate*	3 in.
(4)	COAL	3 in.
(3)	*Slate*	1 in.
(2)	COAL	4 in.
(1)	*Slate.*	

This out-cropping is about 125 feet above low water in the river and is of (50) of the *General Section.*

About one-half of a mile ESE. of the Dafford Mines or in the N. E. ¼ of N. W. ¼ of S. 12, T. 21, R. 9 W., and some ten feet lower, this same coal seam crops out again in what is known as the *Boyd Mine No.* 2. At the mouth of the old drift of this mine, there is the following out-cropping:

Out-Cropping at "Boyd Mine No. 2,"
in the N. E. ¼ of N. W. ¼ of S. 12, *T.* 21, *R.* 9 *W.*

(10)	*Conglomerate*; with an occasional pebble	10 ft. 0 in.
(9)	*Sandstones*; micaceous	3 ft. 0 in.
(8)	COAL; good	11 in.
(7)	COAL; bony	¼ in.
(6)	COAL; good	5 in.
(5)	*Clay Slate*	2 in.
(4)	COAL	2½ in.
(3)	*Black Slate*; smutty	2 in.
(2)	COAL	4 in.
(1)	*Fire Clay*	3 in.
(½)	*Sandstone.*	

This coal out-cropping dips to the south-west.

The *Hewell or Snow Mine,* in the S. E. ¼ of N. W. ¼ of S. 12, T. 21, R. 9 W.; the *Given Mine,* in the S. W. ¼ of N. E. ¼ of S. 12, T. 21, R. 9 W; the *Old Tom Scale's Mine No.* 1, in the N. E. ¼ of S. W. ¼ of S. 12, T. 21, R. 9 W., and the *Old Tom Scale's Mine No.* 2 or the *Clifton Mine,* in the N. E. ¼ of S. W. ¼ of S. 12, T. 21, R. 9 W., are all in the out-croppings of this same seam of coal, (50) of the *General Section,* as it rises to the east and south. Each one of these mines consist of one or more old drifts and at the mouth of one of the old drifts at the *Old Tom Scale's Mine No.* 2 or the *Clifford Mine*, there is the following out-cropping:

Out-Cropping at the "Old Tom Scale's Mine No. 2," or the "Clifford Mine," in the N. E. ¼ of S. W. ¼ of S. 12, T. 21, R. 9 W.

(13)	*Conglomerate.*	
(12)	Coal	4 in.
(11)	*Black Slate*	½ in.
(10)	Coal	2 in.
(9)	*Black Slate*	¼ in.
(8)	Coal	9½ in.
(7)	*Black Slate*	2¼ in.
(6)	Coal	3 in.
(5)	*Black Slate*	1½ in.
(4)	Coal	5 in.
(3)	*Black Slate*	¼ in.
(2)	Coal	3 in.
(1)	*Fire Clay*; fossilferous.	

The coal of the above section is good; and in that section, it will be noticed that the yellow sandstone which usually occurs just over this coal is wanting or that the conglomerate is the immediate covering to the coal. Out-croppings of the above seam of coal are to be seen near the heads of most of the hollows in this neighborhood. Prof. Tuomy in his "First Biennial Report" gives the following sections of the coal seams in the Randolph and Hewell beds; they are doubtless of the same seam of coal as the above, (50) of the *General Section*:

Sections of Coal Seams in the Randolph and Hewell Beds.

	1	2
Coal	4 inches.	
Shale	2 "	
Coal	7 "	10 inches.
Shale	4 "	11 "
Coal	8 "	14 "
Shale	8 "	3 "
Coal	8 "	16 "
Shale	2 "	
Coal	12 "	

Section No. 1, at the Randolph Bed.

Section No. 2, at the Hewell Bed.

Up the spring branch or east from the *Old Tom Scale Mine No.* 2 or the *Clifford Mine*, about one-quarter of a mile, and some twenty-five feet higher, there are several old coal pits into the out-cropping of a seam of coal that is said to be eighteen inches thick. The coal of this out-cropping is light and breaks up into long rectangular pieces, determined in thickness, seemingly, by thin sheets of slate, though it is said to leave but very little ash. When it was hauled to Tuscaloosa, it is said to have had an excellent reputation as a grate coal and a very poor one as a shop coal. This coal is of (53) of the *General Section.* There is a reported out-cropping of coal in the south-east corner of S. 11, T. 21, R. 9 W., eighteen inches thick, which is likely of this same seam.

The *Old Tom Scales Beds No.* 3, consist of a number of old coal pits, in the N. W. ¼ of N. E. ¼ of S. 13, T. 21, R. 9 W., in the out-cropping of (50) of the *General Section.* In the same *forty* as these old pits, though nearly one-quarter of a mile south-east of them, there are other old coal pits which are on the out-croppings of a seam of coal that is some forty feet lower and is reported to be eighteen inches thick. This seam is doubtless (47) of the *General Section* and these old pits are called the *Goree bed on the home tract.* Some thirty feet above these pits, there is an out-cropping of coal smut about eight inches thick, which also shows in the Goree Mill road, in the S. W. ¼ of N. W. ¼ of S. 13, T. 21, R. 9 W., where it is just over a conglomerate with an intervening bed of fire clay from one to two feet thick. This conglomerate on the out-crop is six to eight feet thick. Some thirty feet under this conglomerate, there is, on the side of the road near the Goree old mill, an out-cropping of coal smut that is about ten inches thick. Under this smut, there is fire clay for a few inches in thickness and then a fossiliferous red sandstone. This smut is doubtless of (46) of the *General Section.*

On the side of the road, across Hurricane Creek from the last out-cropping of coal smut and some 200 yards north-east of it, and twelve feet lower, there is an other showing of coal smut about eight inches thick. It is probably (45) of the *General Section.* Along the bed of the creek, at the Goree old mill, between these last two out-croppings, and some twenty feet lower than the last one, there is a massive and slabby sandstone of an ashy gray color; it contains streaks of coal. The banks of the creek, here at the old mill, is made up principally of hard shales, over the above sandstone, in which there is considerable *clay iron stone* both as layers of nodules and as stratified seams.

In a branch on the west side of Hurricane Creek, in the S. E. ¼ of N. E. ¼ of S. 13, T. 21, R. 9 W., and some ten feet above the level of low water in the creek, there is an out-cropping of coal that is thought to be about eighteen inches thick. It is doubtless of (45) of the *General Section.* To the SWS. of this coal about one-quarter of a mile or just over a ridge from it, in the N. E. ¼ of S. E. ¼ of S. 13, T. 21, R. 9 W., and some forty-five to fifty feet higher, are the *Billy Cox Coal Mines.* These mines consist of a half-dozen old drifts in the out-croppings of (47) of the *General Section.* The following is a section of the out-croppings at these mines:

Out-Cropping at the "Billy Cox Mines,"
in the N. E. ¼ of S. E. ¼ of S. 13, *T.* 21, *R.* 9 *W.*

(8)	*Conglomerate;* massive	15 ft. 0 in.
(7)	COAL	8 in.
(6)	*Slate*	2 in.
(5)	COAL	4½ in.
(4)	*Slate*	1½ in.
(3)	COAL	7 in.
(2)	*Fire Clay*	1 ft. 3½ in.
(1)	*Sandstone;* visible	6 ft. 0 in.

In the S. E. ¼ of N. W. ¼ of S. 13, T. 21, R. 9 W., on the same branch as the next to the last coal out-cropping mentioned and seeming some ten to twelve feet below the Cox Mines, there is a reported out-cropping of coal about twelve inches thick.

The above out-croppings near the Goree old mill have a dip of 4° to 5° seemingly to the south-west though it may be to the north-west.

South of the Goree old mill about two miles, there are numerous out-croppings, along Bee Branch, of these coal seams, (45), (46) and (47) of the *General Section.* The upper seams of these out-crops is known as the *Factory Seam* and into its out-croppings, there have been driven a number of drifts. The following is an approximate section of the measures containing the out-crops of these three seams of coal on the waters of Bee Branch in the S. W. corner of T. 21, R. 8 W. and the S. E. corner of T. 21, R. 9 W.:

Approximate Section of the Out-Croppings in the S. W. Corner of T. 21, R. 8 W. and the S. E. Corner of T. 21, R. 9 W.

(7)	*Conglomerates*	25 ft. 0 in.
(6)	COAL; *Factory Seam;* about	1 ft. 10 in.
(5)	*Fire Clay*; about	2 ft. 0 in.
(4)	*Sandstones, Shales*; about	30 ft. 0 in.
(3)	COAL; (46) of the *General Section*	10 in.
	Fire Clay; about	1 ft. 6 in.
	COAL	1 in.
(2)	*Sandstones, Shales*; about	20 ft. 0 in
(1)	COAL; (45) of the *General Section*	1 ft. 6 in.

In the N. E. ¼ of S. E. ¼ of S. 24, T. 21, R. 9 W., at the farthest down the branch or most northern of the drifts into the *Factory Seam*, there is the following out-cropping:

Out-Cropping on Bee Branch, in the N. E. ¼ of S. E. ¼ of S. 24, T. 21, R. 9 W.

(7)	*Conglomerate;* bluff	20 ft. 0 in.
(6)	COAL	6 in.
(5)	*Slate*, COAL	1 ft. 0 in.
(4)	COAL	6 in.
(3)	*Fire Clay*; with streaks of COAL	9 in.
(2)	COAL	8 in.
(1)	*Fire Clay.*	

The above out-cropping of coal occurs at the mouth of the old drift and is badly weathered.

Up the branch or to the SWS. about 400 yards from the above out-cropping, though in the same *forty*, there is an old shaft which commences in debris a few feet above the level of the intermediate seam, (3) of the above approximate section, and extends down into the coal seam of eighteen inches thickness or the lowest of the seams of the above approximate section. In the blue shale that was thrown out in the digging of this shaft, there are many beautiful impressions of coal plants, and, in the carbonaceous gray sandstone of this shaft, there are thin sheets of cubical coal, about one-sixteenth of an inch thick, which are perfect casts of leaves, twigs, etc. About 100 yards SWS. of this shaft, in the road and in a small branch, there is an out-cropping of the intermediate seam, (3) of the above approximate section. Under this coal out-cropping, there is fire clay, visible to a thickness of three feet, that is full of stem and leaf impressions. About 100 yards north-west of the shaft and between fifteen and twenty feet above the top of the shaft, there is, in the Factory seam, a drift that is drained through an other drift some 250 yards to the north-west of it, hence the dip of this coal seam is here to the north-west.

In the N. E. ¼ of N. E. ¼ of S. 25, T. 21, R. 9 W., there is the following out-cropping:.

Out-Cropping on Bee Branch,
in the N. E. ¼ of N. E. ¼ of S. 25, T. 21, R. 9 W.

(8)	*Conglomerate.*		
(7)	COAL	*Factory Seam,* (47) of the *General Section*	4½ in.
	Slate		2 in.
	COAL; slaty.		6 in.
	Black Slate.		1½ in.
	COAL		4½ in.
(6)	*Fire Clay*; hard, full of fossil impressions		2 ft. 0 in.
(5)	*Debris*; about		12 ft. 0 in.
(4)	*Sandstones;* hard and slabby and of a yellowish gray color, bluffy		15 ft. 0 in.
(3)	*Slate*; hard		6 in.
(2)	COAL		10 in.
	Fire Clay; about		1 ft. 6 in.
	COAL; reported		1 in.
(1)	*Debris*; to level of Bee Branch		4 ft. 0 in.

At this out-cropping, the strata are in waves from north-west to south-east.

About 150 yards and 300 yards higher up Bee Branch to the ENE., the coal (2), of the above section, is seen cropping out about four feet above the bed of Bee Branch.

Along the branch in the N. W. ¼ of S. 25, T. 21, R. 8 W., there are ten or a dozen old drifts into the out-croppings of the Factory Seam. The following four sections are of out-croppings at the mouths of four of these old drifts:

Out-Croppings on Bee Branch,
in the N. W. ¼ of S. 25, T. 21, R. 9 W.

		1	2	3	4
(11)	*Conglomerate;* cover.				
(10)	COAL	0 in.	4½ in.	0 in.	0 in.
(9)	*Black Slate*	0 in.	1½ in.	0 in.	0 in.
(8)	COAL	4½ in.	1 in.	8 in.	6 in.
(7)	*Black Slate*	2 in.	1½ in.	1½ in.	½ in.
(6)	COAL; shaly, *splintering*	6 in.	5 in.	8 in.	8 in.
(5)	*Black Slate*	1½ in.	2 in.	1½ in.	1½ in.
(4)	COAL	4½ in.	6 in.	9 in.	7 in.
(3)	*Fire Clay*; visible	24 in.	18 in.	26 in.	28 in.
(2)	COAL; slaty			1 in.	2 in.
(1)	*Fire Clay*; visible			6 in.	12 in.

The above sections are all of out-crops on the north-east side of the branch where the coal is better and thicker though the conglomerate cover is thinner, than they are on the south-west side of the branch. This coal seam is in waves from the south-east to the north-west, though it has a general dip to the north-west of 6° to 8°, which is greater than the fall of the branch, hence its out-crops get higher and higher above the branch to the south-east, and finally it crops out over the general level of the country, along this branch, before the railroad, at Olmstead Station, is reached. The conglomerate cover to this seam varies in thickness from about twenty feet to thirty-five feet and has pebbles all through it, though the pebbles are especially numerous near the top and bottom, where there are sometimes seams from five to ten feet in thickness of nothing more than a conglomeration of these pebbles, they are so thick.

About one-half of a mile higher up the branch than any of the above out-croppings or near the center of S. 31, T. 21,

R. 8 W., there are several out-croppings of the lower of the three seams along Bee Branch or of the seam at the bottom of the shaft in the N. E ¼ of S. E. ¼ of S. 24, T. 21, R. 9 W.

Several of these out-croppings are about as follows:

Out-Croppings of (45) *of the General Section on Bee Branch, near the center of S.* 31, *T.* 21, *R.* 8 *W.*

	1	2	3
(3) *Sandstone*	10 ft. 0 in.	10 ft. 0 in.	10 ft. 0 in.
(2) COAL	1 ft. 3 in.	1 ft. 3 in.	1 ft. 4 in.
(1) *Fire Clay*	3 ft. 0 in.	3 ft. 0 in.	

Section (1) is in the S. E. corner of the N. W. ¼ of S. 31, T. 21, R. 8 W., about 100 yards north of the railroad.

Section (2) is in the N. W. corner of the S. E. ¼ of S. 31, T. 21, R. 8 W., and is in the banks of the branch under the tram-way bridge just east of the lumber yard on the railroad.

Section (3) occurs in an old pit just north of the railroad and west of Olmstead Station.

In the out-cropping of *Section* (1), the sandstone cover in the lower part is shaly and in the upper part is very massive. For about a foot above the coal, it is so ferruginous as to be almost an iron ore. In two other out-croppings of this coal twenty yards and 200 yards farther up the branch than that of *Section* (1), the covering is altogether slabby and flaggy sandstones. This sandstone cover of the out-croppings of *Sections* (2) and (3) is also slabby and that of *Section* (3) was seen to have in it thin seams of cubical coal one-sixteenth of an inch thick, of just the shape of coal plant impressions, as are in the sandstones that come out of the shaft on Bee Branch, in the N. E. ¼ of S. E. ¼ of S. 24, T. 21, R. 9 W.

In the railroad cut just south of Olmstead Station, there is an out-cropping of the intermediate seam of the three that crops out on Bee Branch. This coal was visible to a thickness of about eight inches, though it is said to be about twelve inches thick. It has a cover of a coarse grain sandstone, which contains, in the lower part, thin streaks of coal.

There is a reported out-cropping of coal in the Huntsville road, in the S. W. ¼ of S. W. ¼ of S. 31, T. 21, R. 8 W., and one, that is said to be twelve inches thick, in the N. W. ¼ of S. W. ¼ of S. 31, T. 21, R. 8 W.; they are probably of (44) and (45) of the *General Section.*

In the railroad cut about one-half of a mile west of Olmstead Station, there is an out-cropping of conglomerate, which we believe are of the rocks just over the intermediate seam of the above out-crops on Bee Branch. Still farther to the west, on the north side of the railroad, in the N. E. ¼ of N. E. ¼ of S. 36, T. 21, R. 9 W., in an out-cropping of this same conglomerate, there is a quarry from which a great deal of rock has been taken by the railroad men for building culverts, piers, abutments, etc. In this quarry, the rock is about thirty feet thick and is a coarse grain carbonaceous conglomerate of a bluish gray color, and when free of pebbles is a fine building stone. The pebbles are not very numerous and those presnt are confined mostly to patches and streaks, and are of a dark color. These rocks are at the bottom in two thick seams, each of from five to six feet in thickness, that, in places, are almost free of pebbles. Above these two thick seams, the rocks are of an inferior quality, and are cut up into slabs by streaks of ferric oxide. These upper rocks also contain imbedded in them, lumps of very hard coal several inches in thickness and streaks of hard cubical coal which are perfect casts of twigs and leaves. There is said to be a thin seam of coal under the rocks of this quarry, which we believe to be the intermediate seam of the out-crops on Bee Branch. Nearly thirty feet above this coal, there is, on the side of the road about 150 yards north-west of the quarry, an out-cropping of coal smut from fourteen to fifteen inches in thickness. It is doubtless of the Factory Seam, (47) of the *General Section.* North some 200 yards from this coal smut and only a few feet lower, there is an other out-cropping of this Factory Seam, and about sixty yards north-east of this last outcropping, it shows about as follows :

Out-Cropping of the "Factory Seam," in the S. E. ¼ of S. E. ¼ of S. 25, T. 21, R. 9 W.

(5)	*Conglomerate.*	
(4)	Coal	9 in.
(3)	*Black Slate*	2 in.
(2)	Coal	6 in.
(1)	*Fire Clay*; about	3 ft. 6 in.

On the side of the hill just south-east of the Factory or Cottondale, or in the S. E. ¼ of S. E. ¼ of S. 26, T. 21, R. 9 W., there are out-croppings of a massive conglomerate that is full of pebbles. It is most likely the conglomerate over (51) the *General Section.* In the Factory yard, a boring is said to have been made several years ago, in which three seams of coal, ranging in thickness from fifteen inches to twenty-five inches, were gone through. These three seams of coal are believed to be of (51) of the *General Section*, and of the *upper* and *lower groups* of (50) of the *General Section.*

On Hurricane Creek, in the N. W. ¼ of N. E. ¼ of S. 23, T. 21, R. 9 W., or about one-fourth of a mile SES. of the bridge, there is the following out-cropping:

Out-Cropping in the N. W. ¼ of N. E. ¼ of S. 23, T. 21, R. 9 W.

(4)	*Sandstone*; massive bluff	15 ft. 0 in.
(3)	*Shale, Debris*	12 ft. 0 in.
(2)	Coal	8 in.
(1)	*Shale*; hard	7 ft. 0 in.

This coal is most probably the *upper bench* of (48) of the *General Section.* It has a dip of 3° to 4° to the north-west and is some twelve to fourteen feet above Prude's mill-pond. Near the same level as this coal, perhaps a few feet higher, there is an out-cropping of coal smut in a dry branch about seventy-five yards west of the bridge. Just over this coal smut, there is some ferruginous conglomerate. Across the creek and just below the bridge, or between the bridge and Prude's Mill, there is the following out-cropping of coal which is believed to be of the lower part of the same seam as that of the last out-cropping, (48) of the *General Section*:

Out-Cropping near "Prude's Mill," in the S. W. ¼ of S. E. ¼ of S. 14, T. 21, R. 9 W.

(11)	*Sandstones, Debris*; the sandstones is massive and has in it thin sheets of coal	5 ft. 0 in.
(10)	*Shale*	1 ft. 3 in.
(9)	COAL	1½ in.
(8)	*Slate*	2 in.
(7)	COAL	2 in.
(6)	*Slate*	3½ in.
(5)	COAL SMUT	2½ in.
(4)	*Clay Slate*	4 in.
(3)	COAL	8 in.
(2)	*Fire Clay*; about	1 ft. 6 in.
(1)	*Conglomerate.*	

On the side of the hill north-east of this out-cropping about seventy-five yards and some fifteen feet higher, there is an out-cropping of an other seam of coal, which is likely (49) of the *General Section*. Just below the dam at Prude's Mill, there is the following out-cropping:

Out-Cropping at Prude's Mill, in the S. W. ¼ of S. E. ¼ of S. 14, T. 21, R. 9 W.

(5)	*Sandstone*; massive.	
(4)	COAL; believed to be about	1 ft. 6 in.
(3)	*Fire Clay*; about	1 ft. 6 in.
(2)	*Conglomerate;* pebbles all through it, to low water level below the dam	15 ft. 0 in.
(1)	COAL; cubical and hard, in irregular streaks, as thick as four inches, in the conglomerate, for a foot or so above the water level.	

In a seam of most excellent steam and grate coal, about fifteen inches thick, believed to be of the *upper group* of (50) of the *General Section*, that crops out from under the upper and outer bluff on the west side of Hurricane Creek, in S's 9, 10, 15, 16 and 22, T. 21, R. 9 W., there are dozens of old drifts. These drifts have been driven principally by negroes and after the rudest possible manner. They are so numerous simply because the old ones are deserted and new ones are started, as soon as the underbed to the coal gets hard or the mining gets well away from the out-crops. The coal from these mines has been hauled in wagons to Tuscaloosa and Cottondale for many years, where it finds a ready sale. It is preferred for grate purposes to any other coal that is brought to Tuscaloosa, and has a good reputation at the Factory as a steam coal. It is a pure coal without any partings, and burns freely and has a red ash; it is very uniform in thickness and composition. The following analyses are of average samples representing its full thickness:

	(1)	(2)
Specific Gravity	1.327	1.281
Sulphur	.626	2.380
Moisture	5.426	1.838
Volatile Matter	31.952	30.682
Fixed Carbon	59.455	64.339
Ash	3.167	3.141
	100.000	100.000

No. 1, from Prude's Lower Mine.
No. 2, from Chambers' Mine.

The drifts into this seam are known as the Prude, Walker, Foster, Keene and Chambers mines. At *Prude's Upper Mine*, in the S. W. ¼ of N. E. ¼ of S. 22, T. 21, R. 9 W., there is the following out-cropping:

Out-Cropping at "Prude's Upper Mine," in the S. W. ¼ of N. E. ¼ of S. 22, T. 21, R. 9 W.

(6)	*Sandstone*; massive, micaceous, bluff	20 ft. 0 in.
(5)	*Slate*; hard, of a bluish color	8 in.
(4)	*Black Slate;* hard, with thin sheets of *coal*	1½ in.
(3)	COAL; no parting	1 ft. 3 in.
(2)	*Fire Clay*; fossiliferous	1 ft. 6 in.
(1)	*Sandstone.*	

There is considerable iron pyrites in the coal of this out-cropping.

Prude's Lower Mine is about one-half mile WNW. of

Prude's upper mine, or is in the S. E. ¼ of N. W. ¼ of S. 22, T. 21, R. 9 W. At this *lower mine*, there occur the following out-croppings:

Out-Croppings at "Prude's Lower Mine," in the S. E. ¼ of N. W. ¼ of S. 22, T. 21, R. 9 W.

	(1)		(2)	
(7)	*Sandstone*; massive, cover.			
(6)	*Gritty Slate*	3½ in.	*Fire Clay*	30 in.
(5)	COAL	10 in.	COAL	15 in.
(4)	*Parting*	streak.		
(3)	COAL	8 in.		
(2)	*Clay Slate*; underbed.		*Fire Clag*	36 in.
(1)	*Sandstone*.			

An analysis of an average sample of the full thickness of the coal of this out-cropping has been given. The fire clay over and under the coal of *Section* (2) is fossiliferous. *Section* (1) occurs in the Geological Report for 1879-1880. At the *Webb Walker, Col., Mines*, in the S. W. ¼ of S. W. ¼ of S. 15, T. 21, R. 9 W., there is the following out-cropping:

Out-Cropping at "Webb Walker's Mines," in the S. W. ¼ of S. W. ¼ of S. 15, T. 21, R. 9 W.

(8)	*Debris*.	
(8)	*Conglomerate*; massive, visible	10 ft. 0 in.
(7)	*Debris*; about	25 ft. 0 in.
(6)	*Sandstone*; visible	5 ft. 0 in.
(5)	*Slate*; hard	0 to 1 ft. 4 in.
(4)	COAL	1 ft. 3 in. to 1 ft. 5 in.
(3)	*Fire Clay*; underbed, from	2 ft. to. 3 ft. 0 in.
(2)	*Debris*; about	25 ft. 0 in.
(1)	*Sandstone*; slabby.	

In S. 16, T. 21, R. 9 W., there are any number of old drifts into this seam of coal, under the capping or outer bluff from the creek. Under a lower bluff along Hurricane Creek and some thirty to thirty-five feet under the above seam of coal and about thirty feet above low water in Hurricane Creek, in the S. E. ¼ of N. W. ¼ of S. 15, T. 21, R. 9 W., there is an out-cropping of coal, that is believed to be of the *upper bench* of (48) of the *General Section*. It is reported to be about twelve inches thick. It has an underbed of fire clay, and a bluff cover of a hard massive carbonaceous sandstone from fifteen to twenty feet thick. On the opposite or east side of the creek, about 300 yards north-east of this out-cropping and some twenty feet above it, the Prude's, Chambers', etc., seam, the *upper bench* of (50) of the *General Section*, makes its appearance under a bluff and shows continuously, down the creek and under the bluff, for 100 yards or more. Over the ridge, north-east of this out-cropping about one-half mile and some eight to ten feet higher, there is an other out-cropping of this Prude's, Chambers' seam. These last two out-croppings are respectively about as follows :

Out-Croppings in the S. W. ¼ of N. E. ¼ and N. E. ¼ of N. E. ¼ of S. 15, T. 21, R. 9 W.

		(1)	(2)
(3)	*Sandstones*; cover, bluffy.		
(2)	COAL.....	14 inches.	13 inches.
(1)	*Gritty Slate, Fire Clay;* very hard.............		2 feet.

In *Section* (1) the sandstone cover is very massive and is micaceous with black specks all through it; in *Section* (2), it is a similar rock, though somewhat slabby and flaggy. The underbed (1) is a very hard, gritty, micaceous and fossiliferous rock which sometimes looks like a slate; sometimes, a fire clay; and sometimes, a sandstone.

On a branch about three-quarters of a mile NEN. of the out-cropping of *Section* (2) and some forty feet higher, there is an out-cropping of coal, five and a-half inches thick, which is believed to be of (52) of the *General Section*, and in the bed of Boyd's Branch about one-half mile north-east of that out-cropping, or near the center of S. 11, T. 21, R. 9 W., and some thirty-five feet below that out-cropping, there is an out-cropping of coal which is said to be about two feet in thickness and which is (47) of the *General Section*. This last coal is covered by a slabby rock, which is a conglomerate for a few inches over the coal. Down Boyd's Branch, to the north-west about one-quarter of a mile, there is a reported out-cropping of coal, ten inches thick, several feet above the bed of the branch. It is probably of (46) of the *General Section.*

At Chambers' old mill, in the N. E. ¼ of S. W. ¼ of S. 10, T. 21, R. 9 W., the strata are in wrinkles, though they have a general dip of 5° to 6°, seemingly to the S. W. In the S. W. ¼ of S. 10, T. 21, R. 9 W., are the numerous old and new drifts into the Prude's, Chambers', etc., seam, which are known as the *Chambers' Mines.* In the most northern of these, which is in the N. E. ¼ of S. E. ¼ of S. 10, T. 21, R. 9 W., the coal, etc., is as in *Section* (1) below:

Sections in Drifts of "Chambers' Mines," in the S. E. ¼ of S. 9, and S. W. ¼ of S 10, T. 21, R. 9 W.

		(1)	(2)
(4)	*Sandstone.*		
(3)	*Clay Slate*; gritty	0 to 0 ft. 10 in.	1 ft. 8 in.
(2)	COAL	1 ft. 2 in.	1 ft. 3 in.
(1)	*Fire Clay, Clay Slate;* reported	10 ft. 0 in.	

An analysis has already been given of the coal of these mines, which in the drifts of *Section* (1) has in it considerable mineral charcoal and pyrites.

The fire clay or clay slate underbed of this same drift is very hard, away from the out-crop, and is said to be *flinty* in spots. This underbed, however, on exposure and after becoming thoroughly soaked with water, gets to be very muddy. The coal of this drift has a dip to the south-east of about two feet to the 100 feet.

All along from the *Chambers* to the *Walker mines,* there are in the out-croppings of this same seam of coal old drifts which are known as the *Keene* and *Foster mines.*

The following is an approximate section of the visible measures on the waters of Hurricane Creek in S's 9, 10, 11, 15, 16, 21, T. 21, R. 9 W:

Approximate Section of Visible Measures along Hurricane Creek, in S's 9, 10, 11, 15, 16, 21, T. 21, R. 9 W.

(15)	*Debris;* soil, loose rock, about	20 ft. 0 in.
(14)	COAL; about	6 in.

(13)	*Conglomerates, Sandstones*; with doubtless a covered seam of coal	35 ft. 0 in.
(12)	COAL; Prude's, Chambers', etc.	1 ft. 3 in.
(11)	*Fire Clay*	3 ft. 0 in.
(10)	*Sandstones, Debris*; they doubtless cover some coal	15 ft. 0 in.
(9)	COAL; thickness undetermined.	
(8)	*Shales, Sandstones;* about	20 ft. 0 in.
(7)	COAL; with slate partings, visible	2 ft. 0 in.
(6)	*Fire Clay*	2 ft. 0 in.
(5)	*Conglomerates;* about	30 ft. 0 in.
(4)	COAL; (47) of the *General Section*	2 ft. 0 in.
(3)	*Sandstones, Shales,* about	30 ft. 0 in.
(2)	COAL	10 in.
(1)	*Sandstones, Shales*; to bed of creek, about	15 ft. 0 in.

For several miles west of the above coal out-croppings along Hurricane Creek, there is no visible coal. These measures seem to be barren, though, as they are hid by drifts except along the water courses, they may contain covered out-crops of coal. The next visible coal out-croppings are near the State Insane Hospital, some three miles to the west of any of those along Hurricane Creek. Just back of the hospital or in the N. W. ¼ of S. E. ¼ of S. 13, T. 21, R. 10 W., and some seventy-five to eighty feet above low water in the river, there are some old drifts in a slaty seam of coal, doubtless (53) of the *General Section.* The mouths of these old drifts are now entirely covered up. Some twenty-five to thirty feet below this coal out-cropping, there is a bluff of conglomerates which are believed to be of those over (51) of the *General Section.* The Hospital mines its own coal and makes its own gas as well as a supply for the State University. It has two shafts on the south bank of the river, in the S. W. ¼ of S. 13, T. 21, R. 10 W., but only one of them is in use, the other was dug to be ready in case of an emergency. These shafts are of fifty-five feet and eighty feet in depths and are down on the coal (47) of the *General Section,* which is here, below the bed of the river. In the mines of the old shaft, the coal seam has the following sections :

Sections of Coal Seam in the State Hospital Shaft, in the N. W. ¼ of S. W. ¼ of S. 13, T. 21, R. 10 W.

		1	(1)	(2)
(7)	COAL; shaly	½ in.	½ in.	0 in.
(6)	COAL; good	9 in.	COAL; good...17 in.	19 in.
(5)	*Clay Slate*	¼ in.		
(4)	COAL; good	8 in.		
(3)	*Black Slate*	½ in.	½ in.	½ in.
(4)	COAL; good	4 in.	5 in.	5 in.
(1)	*Fire Clay*; visible	36 in.	20 in.	36 in.

Near the foot of the shaft, the seam of coal on one side of the main entry is squeezed out, for several feet along the entry, to only six inches by a bulge in the underlying rocks, while on the opposite side of the entry the coal rises with the bulge and is of its regular thickness. The upper six inches of the fire clay underbed is sometimes soft and full of pyrites. The cover is a massive conglomerate some sixty feet in thickness, with the pebbles, which are especially numerous near the top and bottom, confined principally to patches and streaks. Between the coal and conglomerate, there is sometimes a hard shale or fire clay, which gets to be twelve inches in thickness.

The seam of coal in the above mines is said to dip from near the main entry in opposite directions or to the ESE. and the WNW., hence the above mines must be on the top of the crest of a great wave or on top of an anticlinal fold. This is also shown to be the case by the facts that this seam of coal, is near a level with the bed of the river, just opposite the shaft, whereas one-fourth of a mile up the river or east of the shaft, it is fifty-one feet below low water level and one-fourth of a mile down the river, west of the shaft, it is fifteen feet below low water level, as has been shown by borings.

Down the river or west of the old shaft about 250 yards, is the new shaft. In this new shaft, the coal is said to have been struck at a depth of eighty feet and as the top of the shaft is only about five feet higher than the top of the old shaft, there has been a fall in the coal seam from the old shaft to the new shaft, or in about 250 yards to the west, of about twenty feet. In this new shaft the seam of coal is said to be twenty-two inches thick. Lower down the river, or to the west several hundred yards, is an other shaft, but it was never completed down to the coal. Between these last two shafts, two holes were bored down in the bed of the river; in the upper hole, the *Asylum seam* is said to have been struck eight to nine feet below the bed of the river, and in the lower hole, fifteen feet, as stated, below the bed of the river. Opposite to Big Island and some thirty-five to forty feet above the river, there is said to be under a bluff of massive sandstones an out-cropping of block coal about seven inches thick. It is believed to be of (48) of the *General Section.* About one-fourth of a mile farther down the river or to the west of this last coal out-cropping, there is on the University Branch, a rock quarry and under the rock of this quarry, there is a seam of coal which is doubtless of the same seam as that of the last out-cropping. Considerable rock from this quarry is said to have been used in the building of the old Capitol at Tuscaloosa and the old State University buildings and the present "Wood's Hall" of the University. Opposite to the mouth of the University Branch, the Asylum seam is said to be twenty-seven feet below the bed of the river, as shown by a boring.

Some 150 yards up the branch from the above rock-quarry or south-west of it, there is an out-cropping of coal from six to seven inches thick, which is believed to be some twelve feet or more over that under the rock-quarry.

Just back or north of Maj. McCalla's residence, in the N. E. ¼ of S. W. ¼ of S. 14, T. 21, R. 10 W., there is an old pit which is said to have been dug down to a seam, eighteen to twenty inches thick, of almost pure pyrites. This seam is said to be twenty-five feet below the surface and is not much more than twenty-five to thirty feet above the river; it probably corresponds to (49) of the *General Section.*

In the edge of the city of Tuscaloosa, or in the S. W. ¼ of S. W. ¼ of S. 14, T. 21, R. 10 W., there are several old shafts and drifts into the *upper bench* of (50) of the *General Section* which is here known as the *McLester* and *Duree seam.* This seam is also under a conglomerate rock but it is a much thinner rock than the one over the *Asylum seam.* The *McLester seam* is about nineteen inches thick and has no slate partings. It is believed to be about eighty feet above the Asylum seam. The latest or newest of these shafts that have been sunk down on the *McLester seam* is on the side of the ravine, within the edge of the city of Tuscaloosa, just back of the late Dr. Guild's residence. In this shaft there is the following reported section:

Section of Shaft in the Edge of the City of Tuscaloosa, in the S. W. ¼ of S. W. ¼ of S. 14, *T.* 21, *R.* 10 *W.*

(6)	*Conylomerate*	15 ft. 0 in.
(5)	Coal	5 in. to 0 ft. 6 in.
(4)	*Sandstone*; coarse grain	7 ft. to 8 ft. 0 in.
(3)	*Shale*	4 ft. to 5 ft. 0 in.
(2)	Coal; McLester, Duree seam	1 ft. 6 in. to 1 ft. 8 in.
(2)	*Fire Clay*	2 ft. 0 in.

Down the ravines or north of the above shaft about fifty and one hundred yards, there are two drifts into this McLester, etc, seam, which is here also from eighteen to twenty inches thick. These drifts and the above shaft are between two parallel faults which run in the direction of the dip or WNW. and ESE. and are about 140 yards apart. This strip between the two parallel faults seems to have been pushed up some fifty-five feet above its proper level. On the south-west side of this strip, just over the more southern fault from the above new shaft, there was dug a shaft which struck, twenty-six feet below the bed of the branch or ravine, a seam of coal with numerous slaty partings. It is (53) of the *General Section* and is most probably the same seam as was drifted into just back of the Insane Hospital. In the ravine between the above new shaft and Maj. McCalla's, there is an out-cropping of coal, six inches thick, which is doubtless of the same seam as the upper coal in the new shaft. North-west of this shaft, along the line of the more south-westerly of the above two faults, on each side of it, for about one-half mile, there are numerous old shafts in which the coals (52), (51) and (50) of the *General Section* seem to have been reached. In the nearest one of these old shafts to the new shaft, over a ridge some 400 yards north-west of the new shaft, a seam of coal, seemingly the McLester seam, was struck about fifteen feet below the surface and WNW. from this old shaft about 100 yards and, it is believed, on the opposite side of the fault, there is an other old shaft in which there is said to have been struck, about thirty-five feet below the surface, a seam of coal about six inches thick, probably (52) of the *General Section.* In an other old shaft about 250 yards farther to the WSW. and seemingly on this same or south-western side of the more south-western fault, the same seam of coal, it is believed, as that of the last old shaft was struck about twenty-five feet lower. In the *second bottom* of the river in the S. W. ¼ of S. W. ¼ of S. 14, T. 21, R. 10 W., near the *slaughter-pen*, a hole was bored several years ago in which there is said to have been gone through, at a depth of about sixty feet, a seam of coal six inches thick, and twenty-four feet lower, a seam ten inches thick and about ten feet still lower, a third seam which was thought to be about fifteen inches thick. These coals corresponds to those of (52), (51) and (50) of the *General Section.* About 150 yards north-east of this bored hole, in a ravine and some twenty-five to thirty feet above the level of low water in the river, there is an outcropping of coal about six inches thick, which is doubtless of the same seam as the upper coal in the above bored hole.

The rocks in the river at the foot of the University Falls have a dip of 8° to 10° to the north-west. About three-quarters of a mile lower down the river or under the bridge between Tuscaloosa and Northport, there is on the Tuscaloosa or south side of the river a massive conglomerate that is full of pebbles and appears to have a dip of 25° to 30° to the S. 80° W. This massive conglomerate is seemingly in waves; next to the Tuscaloosa bank, it shows for some three feet above low water level but sinks below the water before it gets one-third of the way across the river. The rocks on the North-port or north side of the river, under the above bridge, is a massive micaceous coarse grain sandstone of a yellowish gray color. It shows for some four to five feet in thickness above low water level and seems to be over the above conglomerate on the south side of the river, and to have a dip of 4° to 5° to the north-west. From out of the bank a few feet over the above conglomerate, there issues a spring of strong chalybeate water which may have its origin in (52) of the *General Section.*

The above massive conglomerates and sandstones in the bed of the river under and just below the Tuscaloosa and North-port bridge, are the first rocky obstructions to navigation that are met with in coming up the Warrior River. Softer and productive strata of the Coal Measures are to be seen farther down the river than the above massive conglomerates and sandstones. or below the present head of navigation of the Warrior River, yet, as below this point they are so well covered up by a newer formation and as no borings have ever been made through this overlying Drift, we can not say for certain what these Coal Measures below the present head of navigation of the Warrior River contain, though we firmly believe that they have much workable coal.

We shall now cross over the river and consider the coal out-crops, etc., of the western half of the Coal Measures of this county or of the Coal Measures west of the Warrior River in this county. These details will be given in a similar way as heretofore and will be taken up as we meet with them in a circuit around this western half of the Coal Measures of Tuscaloosa county from right to left, commencing at North-Post.

The coal out-croppings on this or the west side of the river, in Tuscaloosa county, are as a general thing much thinner than they are on the opposite or east side of the river; this is doubtless due to the fact that they are nearer the edge of the original great coal basin of Alabama.

In a deep gulch about 150 yards WNW. of the bridge between Tuscaloosa and North-Post and about ten feet above low water in the river, there is an out-cropping of a slaty seam of coal that is said to be about three feet six inches thick and to have about two feet six inches in thickness of pure coal. This out-cropping of coal, at the time visited, showed about as follows:

Out-Croppings in the S. W. Corner of S. 15, *T.* 21, *R.* 10 *W.*

(7)	*Debris.*	
(6)	*Shale*; clayey, of a bluish color, visible about	5 ft. 0 in.
(5)	*Sandstone*; shaly	5 ft. 0 in.
(4)	*Shale*; gritty, of a bluish color	4 ft. 0 in.
(3)	COAL, *Slate*; in alternate streaks, each from one to two inches thick	1 ft. to 1 ft. 2 in.
(2)	*Shales*; bluish, about	8 ft. 0 in.
(1)	*Debris*; to low water level in river	2 ft. 6 in.

In the shale (4) of this out-cropping, there was seen a fossil trunk of a treek (Lepidodendron?), of a gray sandstone, somewhat flattened or with diameters of about two feet and one foot six inches, standing perpendicularly and projecting above the shale about one foot. It doubtless extended down to and rested on the seam of coal. This out-cropping of coal is the lowest down the river of any that we have ever seen, though there is a report that there is coal several miles farther down.

In S. 15, T. 21, R. 10 W., there is an out-cropping of coal which has been worked for a long time and which is known as the *Hewell Mine.*

In the N. W. ¼ of S. 10, T. 21, R. 10 W., there are several drifts and shafts into the *Asylum seam*, (47) of the *General Section.* In one of these shafts, in the S. E. ¼ of N. W. ¼ of S. 10, T. 21, R. 10 W., which is being worked by Mr. Duree, there is the following section :

Sections of the Duree Shaft and Mines,
in the S. E. ¼ *of N. W.* ¼ *of S.* 10, *T.* 21, *R.* 10 *W.*

(6)	*Conglomerate.*	
(5)	*Clay Slate*	0 ft. to 11 ft. 0 in.
(4)	COAL	1 ft. 5 in.
(3)	*Black Slate*	0 to 0 ft. 1 in.
(2)	COAL	3½ in.
(1)	*Fire Clay*; gritty near the bottom, visible	5 ft. 0 in.

Though in this shaft the clay slate, (5) of the above section, is eleven feet thick, in the mines, twenty yards from the foot of this shaft, there is said to be none of it or the conglomerate is reported to be right over the coal. The coal in these mines is said to have a dip of about six feet in 100 yards to the E. 15° to 20° S.

Above Mr. Wick Brown's spring, in the N. E. ¼ of N. E. ¼ of S. 25, E. 20, R. 10 W., there is an out-cropping of a conglomerate, which is full of pebbles. It is believed to be the conglomerate that is between (51) and (52) of the *General Section.*

In Carroll's Creek, in the S. W. ¼ of S.E. ¼ of S. 12, T. 20, R. 10 W., not far from its mouth, there is an out-cropping of coal, that is said to be about ten inches thick, from which boat loads of coal have been raised and floated down North River and thence down the Warrior River to Tuscaloosa and Mobile.

Along Brush Ceeek, in the S. W. ¼ of S. E. ¼ of S. 7, T. 20, R. 9 W., and about one-half of a mile farther up the creek to the north-east, there are out-crops of coal which are said to be from eight to ten inches thick and from which boat loads of coal have been raised. On the side of the hill some 110 to 115 feet above these coal out-croppings, there is an out-cropping of conglomerate and fifteen to twenty feet still higher, there are some loose conglomerates along the Water-melon road. These conglomeates belong between (51) and (52) of the *General Section.*

At Snider's Mill, (Collin's old mill), on the head waters of Brush Creek, in the S. E. ¼ of N. W. ¼ of S. 8, T. 20, R. 9 W., the strata, sandstones and shales, have a dip of 8° to 10° to the south-east.

In North River, in the S. E. ¼ of S. W. ¼ of S. 19, T. 20, R. 9 W., about three-fourths of a mile above Baker's Ford, there is a reported out-cropping of coal and some thirty feet above the river, in a branch on the north side of the river just below this ford, there is an out-cropping of very hard coal about three inches thick. The strata at this last out-cropping have a dip of 8° to 10° to the south-east. At the mouth of a branch just above the Thompson Ford, in the N. E. ¼ of N. W. ¼ of S. 29, T. 20, R. 9 W., there is an out-cropping of coal which is said to be ten inches thick and up this branch about one-fourth of a mile to the north-east, there is a reported out-cropping of coal two feet thick.

These two coals are believed to be of (46) and (47) of the *General Section.* The divide between North River and the Warrior River down near their confluence, is known as *the point*; this point is from 250 to 300 feet above drainage level and is bi-sected by Little Yellow Creek, and is for the most part covered by a fine growth, principally of long leaf pine. The portion of it between Little Yellow Creek and the river is one pine forest of very fine timber. Over this divide, principally on the waters of Little Yellow Creek, in S's 20, 21, 22, 26, 27, 28, T. 20, R. 9 W., there are numerous out-croppings of the two seams of coal (53) and (50) of the *General Section,* which are here called respectively the *Block Coal Seam* and the *Double Seam.*

On the side of a branch, in the S. W. ¼ of N. E. ¼ of S. 20, T. 20, R. 9 W., there is an out-cropping of the *Double seam,* (50) of the *General Section* in what is known as the *Stoker Coal Bed.* At this bed there is about the following out-cropping:

Out-Cropping at the Stoker " Coal Bed,"
in the S. W. ¼ of N. E. ¼ of S. 20, T. 20, R. 9 W.

(11)	*Conglomerate*; full of pebbles, about	20 ft. 0 in.
(10)	Coal	4 in. to 0 ft. 5 in.
(9)	*Slate*; believed to be only in places	streak.
(8)	Coal	2 in.
(7)	*Clay Slate;* dark colored	1 in.
(6)	Coal	2 in.
(5)	*Black Slate*	2 in.
(4)	Coal	4 in.
(3)	*Clay Slate*	8 in.
(2)	Coal; lower bench	1 ft. 2 in.
(1)	*Slate.*	

Farther up this branch about one-quarter of a mile to the SWS. and some twenty-five feet higher, there is an out-cropping of the *Block Coal Seam* (53) of the *General Section* at the school-house spring.

About one mile SES. of the *Stoker coal bed,* and some twenty feet lower, there is an out-cropping of the *Double seam* in what is known as the *Camak Coal Bed.* The *Snider*

Coal Bed No. 2, in the S. E. ¼ of S. E. ¼ of S. 21, T. 20, R. 9 W., is in this same seam of coal.

At the *Snider coal bed No.* 2, the out-cropping is about as *Section* (1) of the following sections :

Out-Croppings of the "Double Seam," in S's 21 *and* 27, *T.* 20, *R.* 9 *W.*

		(1)	(2)
(14)	*Conglomerate*	15 ft. 0 in.	5 ft. 0 in.
(13)	*Slate*; with *Kidney ore.*	6 ft. 0 in	0 0
(12)	COAL	2 in.	COAL 8 in.
(11)	*Slate*	⅛ in.	
(10)	COAL	1½ in.	
(9)	*Slate*	¼ in.	
(8)	COAL	4½ in.	
(7)	*Slate*	1 in.	½ in.
(6)	COAL	2 in.	2 in.
(5)	*Slate*	1 in.	¾ in.
(4)	COAL	4 in.	5 in.
(3)	*Clay Slate*; hard, fossiliferous.	2 ft 4 in.	2 ft. 0 in.
(2)	COAL; good, free from slate.	1 ft. 1 in.	1 ft. 2 in.
(1)	*Slate*; underbed.		

Section (1) is of the out-cropping at *Snider's Coal Bed No.* 2, in the S. E. corner of S. 21, T. 20, R. 9 W.

Section (2) is from the Geological Report tor 1879-1880 and is of an out-cropping in the S. W. corner of the N. W. ¼ of S. 27, T. 20, R. 9 W.

This *Double Seam* also crops out in the N. E. ¼ of N. W. ¼ and in the N. W. ¼ of S. E. ¼ and in the S. W. ¼ of N. W. ¼ of S. 21, T. 20, R. 9 W. The out-cropping in the N. W. ¼ of S. E. ¼ of S. 21, T. 20, R. 9 W., is called the *Snider Coal Bed No.* 1. The following analysis is of an average sample of the coal of a vertical section of this *Double Seam*, less the slate partings:

Specific Gravity	1,304
Sulphur	2,129
Moisture	1,810
Volatile Matter	34,029
Fixed Carbon	58,240
Ash	5,921
	100,000

In the ravines on top of the divide in S's 20, 22, 25, 27, T. 20, R. 9 W., there are numerous out-croppings of the *Block Coal Seam* which is believed to be (53) of *General Section. The Colbert Coal Beds* are a number of surface diggings in the out-crops of this *Block Coal Seam* on the top of the divide in the N. E. ¼ of S. 22, T. 20, R. 9 W. These pits are some forty feet or more above the *Double seam* in its out-cropping at the *Snider Coal Bed No. 1.*

The *Hit Coal Beds* are in this same Block Coal Seam in its out-croppings about one and a-quarter miles south-east of the *Colbert beds* or in the N. W. corner of S. 26, T. 20, R. 9 W. The *Miller Coal Beds No. 1,* are in the out-croppings of this same seam of coal about one-quarter of a mile west of the *Hit beds ;* the *Miller Coal Beds No.* 2 are in the out-croppings of this same seam about 300 yards to the north-west of the *Miller beds No.* 1 and still farther to the north-west about one-quarter of a mile are the out-croppings of this same seam in what are known as the *Miller Beds No.* 3. This *Block Coal Seam* in its out-croppings at the *Hit and Miller beds* has about the following sections:

Out-Croppings of the " Block Coal Seam" at the Hit and Miller Coal Beds in S. 26, 27, 22, *T.* 20, *R.* 9 *W.*

		(1)	(2)	(3)
(6)	*Slate, Soap-stone*; cover.			
(5)	COAL; bony on top..........	21 in.	21 in.	24 in.
(4)	*Slate*......	3½ in.	2 in.	2 in.
(3)	COAL	4½ in.	4½ in.	3 in.
(2)	*Slate*	1 in.	2 in.	1 in.
(1)	COAL; in blocks..............	4 in.	3½ in.	4 in.

Sections (1) and (2) are of the out-croppings respectively at the *Hit beds and Miller beds No.* 3.

Section (3) is from the Geological Report for 1879-1880 and is believed to be of the out-cropping at the *Miller beds No 1*, in the N. W. ¼ of N. E. ¼ of S. 27, T. 20, R. 9 W. The cover to this seam of coal is a *blue clay slate,* which resembles *soap-stone.* This coal has been surface dug a great deal and hauled in wagons to Tuscaloosa where it had an excellent reputation. The following analysis, representing an average sample of the full thickness of the seam of coal as given in *Section* (3) above, less the slate partings, is taken from the Geological Report for 1879-1880, and will serve to show the quality of this coal in its badly weathered outcrops:

Specific Gravity	1.411
Sulphur	1.613
Moisture	2.239
Volatile Matter	34.606
Fixed Carbon	50.375
Ash	12.780
	100.000

Some fifty feet lower than the out-cropping of the *Double Seam* at the *Snider coal beds No.* 1, and about three-quarters of a mile south of those beds, there is in the bed of *Little Yellow Creek*, in the N. W. ¼ of S. E. ¼ of S. 28, T. 20. R. 9 W., just below Jacob Snider's old mill site, the following out-cropping of (46) of the *General Section:*

Out-Cropping in Little Yellow Creek just below Jacob Snider's Old Mill, in the N. W. ¼ of S. E. ¼ of S. 28, T. 20, R. 9 W.

(3) *Sandstones*; slabby.
(2) COAL; breaking out in blocks...... ....9½ in.
(1) *Fire Clay.*

At this out-cropping the rocks dip 6° to 8° to the north and as the general dip on this side of the Warrior River is to the south-east, the strata must be here in waves. Down the creek, SWS. from this out-cropping about one-quarter of a mile and some ten feet lower, there is an out-cropping of coal which is said to be thirty inches thick, though it is believed to be of the same seam as that above, just below the old mill. This coal may be of (45) of the *General Section.* At this last out-cropping, the strata have their regular dip to the south-east.

In the northern bank of Little Yellow Creek near its mouth or in the S. E. ¼ of S. W. ¼ of S. 35, T. 20, R, 9 W. and some thirty feet above low water in the river, there are two drifts, known as the *Goree or Peacock Mines*, into the out-croppings of the *University Seam*, (43) of the *General Section.* At these mines there are the following out-croppings :

Out-Croppings at the "Goree or Peacock Mines," on Little Yellow Creek, in the S. E. ¼ of S. W. ¼ of S. 35, T. 20, R. 9 W.

		(1)	(2)	(3)
(10)	*Shale;* gritty, hard, cover.			
(9)	*Shale*; gritty, soft	0 in.	10 in.	6 in.
(8)	COAL	7 in.	7 in.	8 in.
(7)	*Slate*	2 in.	¼ in.	1½ in.
(6)	COAL	1 in.	1½ in.	COAL . . 4 in.
(5)	*Slate*	streak.	½ in.	
(4)	COAL	2 in.	3½ in.	
(3)	*Slate*	2½ in.	2½ in.	1½ in.
(2)	COAL	10 in.	10 in.	10 in.
(1)	*Fire Clay*; gritty.			

Sections (1) and (3) are of the out-croppings at the mouths of the *upper* and *lower drifts*, respectively. *Section* (2) is from the Geological Report for 1879-1880 and occurs at one or the other of these drifts.

About twenty-three feet above the coal in the lower drift of the Goree or Peacock mines, with massive gritty shale, containing some thin seams of sandstone, between, there is an out-cropping of coal smut, (44) of the *General Section*, five and one-half inches thick, under a bluff of slabby and shaly sandstone from fifteen to twenty feet high.

The *University seam*, (43) of the *General Section*, crops out in several other places on this or the north side of the river, in the same section as the Goree or Peacock mines, or in S. 35, as well as in S. 36, T. 20, R. 9 W. It and the thin coal seam twenty to thirty feet above it, are both seen on the Jim Mack Branch, in the N. W. ¼ of S. E. ¼ of S. 35, T. 20, R. 9 W., about as follows :

Out-Croppings along "Jim Mack Branch," in the N. W. ¼ of S. E. ¼ of S. 35, T. 20, R. 9 W.

(10)		*Sandstones*; massive, slabby, shaly, forming a beautiful crescent shape bluff over which the branch has a perpendicular fall of	50 ft. 0 in.
(9)		COAL; very hard, of uniform thickness	6 in.
(8)		*Fire Clay*; hard and gritty, about	5 ft. 6 in.
(7)		*Shales, Sandstones*; about	20 ft. 0 in.
(6)	University Seam.	COAL	1½ in.
		Slate or *Shale*	streak.
		COAL	1½ in.
		Slate; only in places	streak.
		COAL	3 in.
		Black Slate	⅛ in.
		COAL; cubical	3 in.
		Mother of Coal	¾ in.
		COAL; cubical	1½ in.
		Slate; only in places	streak.
		COAL; cubical	.4 in.
		Slate; soft and shaly	4 in.
		COAL; good and hard	9 in.
		Black Slate	2½ in.
		COAL; good	12 in.
		Slate; hard, grayish	1¾ in.
		COAL; slaty at the bottom, hard	2 in.
(5)		*Fire Clay*; gritty, hard, fossiliferous	3 ft 0 in.
(4)		*Sandstone*; about	8 ft. 0 in.
(3)		COAL; visible	1½ in.
(2)		*Clay Slate*	3 ft. 0 in.
(1)		*Sandstone.*	

The following section is given in the Geological Report for 1879-1880 of an out-cropping of this *University seam* on the Jim Mack Branch:

Out-Cropping of the "University Seam" on "Jim Mack Branch," in the S. E. ¼ of S. 35, T. 20, R. 9 W.

(14)	*Gritty Slate*	20 ft. 0 in.
(13)	*Parting Slate*	1 in.
(12)	COAL; good	8½ in.
(11)	*Slate*	¾ in.
(10)	COAL; good	5½ in.
9)	*Slate*	4 in.
(8)	COAL; good, cubical blocks	9½ in.
(7)	BONY COAL	1½ in.
(6)	*Black Shale*	2½ in.
(5)	COAL	11 in.
(4)	*Slate*	3 in.

(3)	COAL	2 in.
(2)	*Black Shale*	3 in.
(1)	*Bottom Slate.*	

On the next branch up the river from the Jim Mack Branch or in the N. E. ¼ of S. W. ¼ of S. 36, T. 20, R. 9 W., there are out-croppings of the *University seam* and the thin seam above it, as follows:

Out-Croppings,
in the N. E. ¼ of S. W. ¼ of S. 36, T. 20, R. 9 W.

(7)	*Sanastones*; massive above, shaly below, forming a crescent shape bluff over which the branch has a perpendicular fall of about	20 ft. 0 in.
(6)	*Shale*; hard and gritty.	6 ft. 0 in.
(5)	*Sandstone*; slabby, hard, bluish gray	3 ft. 0 in.
(4)	COAL; *bluff seam*	8½ in.
(3)	*Fire Clay* or *Clayey Shale*; hard	3 ft. 0 in.
(2)	*Shales*; with perhaps some thin seams of sandstone, about	18 ft. 0 in.
(1) *Uni'ty Seam*	COAL	10 in.
	Slate	3½ in.
	COAL	3 in.
	Slate	3½ in.
	COAL	2 ft. 1 in.
	Slate	3 in.
	COAL	2½ in.
	Slate	½ in.
	COAL	8 in.

The *University seam*, as in the above section, is a little better than seven feet below the bed of the branch at the fork, where it was bored through by Maj. W. J. Kelley; down the branch, however, about fifty yards, there is a chalybeate spring which rises in the covered out-crop of this coal seam, as is indicated by an out-cropping of the thin or bluff seam, from eight to nine inches thick, on the side of the hill about twenty feet above this spring. Some ten to twelve feet lower, there is near the mouth of this branch and two to three feet above low water in the river, an other chalybeate spring which very likely rises in the thin coal seam seen on Jim Mack Branch about eleven feet below the *University seam*. In this neighborhood, along the Warrior River near the mouth of Little Yellow Creek, there seems to be very little uniformity in the dip of the strata, though the general dip is doubtless to the ESE. The above out-croppings of the University seam are of very different horizontal positions, and, as given by Maj. Kelley, are about as follows with respect to the high water mark and its out-cropping at the *University Mines*, on the south side of the river, in the N. E. ¼ of S. 2, T. 21, R. 9 W.

(1) The University Mines are said to be ten feet below the high water mark.

(2) The Goree or Peacock Mines, on Little Yellow Creek, one-half mile N. 70° W. of the University Mines, are twenty feet above the high water mark.

(3) The out-croppings on Jim Mack Branch, three-eighths of a mile N. 20° E. of the University Mines, are about eight feet above high water mark or eighteen feet above the University Mines.

(4) The out-croppings on the branch in the N. E. ¼ of S. W. ¼ of S. 36, T. 20, R. 9 W., are away below the high water mark.

Maj. Kelley says that on the head waters of the Jim Mack Branch, the *Block Coal Seam* is only twenty-one inches thick, without any slate partings, and that he could not find the *Double Seam*. From the above details, we gather that the following is an approximate section of the visible coal out-croppings on Little Yellow Creek down in *the point*:

Adproximate Section of Visible Coal Out-Croppings along Little Yellow Creek, down in "The Point."

	Measures, Capping Drift	30 ft. 0 in.
(9)	COAL; *Block Coal Seam*	2 ft. 9 in.
	Measures; *Conglomerates*, etc.	40 to 60 ft. 0 in.
(8)	COAL; *Double Seam*	2 ft. 6 in. to 5 ft. 0 in.
	Measures	40 to 60 ft. 0 in.
(7)	COAL	9½ in.
	Measures	20 ft. 0 in.
(6)	COAL; reported	2 ft. 0 in.
	Measures	20 to 10 ft 0 in.
(5)	COAL; *Bluff Seam*	8 in.
	Measures	15 ft. 0 in.
(4)	COAL; *University Seam*; about	4 ft. 0 in.
	Measures	15 ft. 0 in.

(3)	COAL; bottom stratum of Univ. Seam	1 ft. 0 in.
	Measures	35 ft. 0 in.
(2)	COAL	1 ft. 3 in.
	Measures	16 ft. 0 in.
(1)	COAL	1 ft. 8 in.

The coals (1) and (2) of the above section are respectively about fifteen feet and thirty-four feet below low water level in the river at the mouth of Little Yellow Creek, as shown by a boring. The coals of the above section are of the seams from (40) to (53), inclusive, of the *General Section.*

Along Lick Branch in S's 23, 24, T. 20, R. 9 W., there are numerous comparatively thin out-croppings of coal which are believed to belong to the seams from (40) to (47) of the *General Section.*

The upper one of these coal out-croppings, in the S. E. ¼ of N. E. ¼ of S. 23, T. 20, R. 9 W., is covered by debris and shows coal to a thickness of only six inches. Down the branch some 175 yards to the south-west and about twenty feet lower, there is the following out-cropping, under a water-fall:

Out-Cropping on Lick Branch, in N. W. ¼ of S. 24, T. 20, R. 9 W.

(4)	*Sandstone;* massive and slabby	8 ft. 0 in.
(3)	*Shale*	6 ft. 0 in.
(2)	COAL; from	10 in. to 1 ft. 0 in.
(1)	*Fire Cay;* visible	4 in.

This is a good hard coal with a vertical flaggy structure; it is likely of (46) of the *General Section.*

Some 300 yards farther down the branch to the south-east and some eight to ten feet lower, there is a similar out-cropping to the last in which the coal is from seven to nine inches thick. These two coal out-croppings may be of the same seam though this last one is believed to be of a some-what lower seam. Down the branch still farther or in the S. E. ¼ of S. E. ¼ of S. 24, T. 20, R. 9 W., and some forty-five feet lower, there is an out-cropping that shows coal to a thickness of four inches with a slaty parting. About 150 yards still farther down the branch and some six to eight feet lower, there is an other out-cropping that shows coal to a thickness of thirteen inches. This out-cropping dips to the north-west while the others dip to the south-east, hence the strata are in waves. Still farther down the branch about 100 yards to the south-east and ten feet lower, there is an other showing of coal from ten to fifteen inches thick which also dips to the north-west. Along the bed of this branch are to be seen *bumps or protruberances* in the strata, such as when in mines are called *hog-backs*, etc., by the miners.

Near the mouth of a branch which empties into the river at the head of the Arnold Shoals, in the S. W. ¼ of S. W. ¼ of S. 20, T. 20, R. 8 W., and some six to eight feet above low water in the river, there is an out-cropping of coal smut, visible to a thickness of about eight inches. This out-cropping and the lowest one on Lick Branch are likely of the same seam, (40) of the *General Section.*

On Fish Trap Branch, near the center of S. 19, T. 20, R. 9 W., some seventy feet above low water in the river, there is an out-cropping of coal from nine to ten inches thick, which may be of the same seam as the next to the lowest out-cropping on Lick Branch, or of the *under bench* of the *University Seam.*

Near the top of the divide or some 275 feet above the river in the N. W. ¼ of S. 19, T. 20, R. 8 W., there are some ferruginous conglomerates which look like they are of the Drift though they are believed to be of the conglomerates between (47) and (48) of the *General Section.*

In the S. W. ¼ of S. 20, T. 20, R. 8 W., on a branch which empties into the river opposite to Langston Shoals, there is about forty feet above low water in the river an out-cropping of a seam of coal thirteen inches thick and about twenty feet higher, an out-cropping of a seam eight inches thick. These two coal out-croppings are probably (39) and (40) of the *General Section.*

Some forty feet below the top of the divide in the N. W. ¼ of N. W. ¼ of S. 19, T. 20, R. 8 W., there is the following out-cropping:

Out-Cropping in the N. W. ¼ of N. W. ¼ of S. 19, T. 20, R. 8 W.

(6) *Conglomerate*; ferruginous.	
(5) *Shale;* bluish, visible	2 in. to 0 ft. 3 in.
(4) COAL; about	1 ft. 0 in.
(3) *Slate*	½ in.
(2) COAL	8½ in.
(1) *Clay Slate;* visible	3 ft. 0 in.

Just over the divide from this out-cropping or to the north-west of it about 300 yards and some eight to ten feet lower, there is the following out-crop, in the S. W. ¼ of S. W. ¼ of S. 18, T. 20, R. 8 W., which is doubtless of this same seam, (47) of the *General Section* :

Out-Cropping in the S. W. ¼ of S. W. ¼ of S. 18, T. 20, R. 8 W.

(7) *Loose Pebbles, Debris.*	
(6) *Conglomerate*; ferruginous	6 in.
(5) *Clay*; light color	1 ft. 0 in.
(4) *Conglomerate*; ferruginous, full of pebbles	10 in.
(3) *Clay Slate*; fossiiiferous, with streaks of *coal* in the lower part	6 ft. 0 in.
(2) COAL	2 ft. 1 in.
(1) *Clay Slate*	1 ft. 0 in.

This out-cropping appears to dip to the north-west.

In the same *forty* as the last out-cropping of coal and some twenty feet lower, there is an out-cropping of coal smut about ten inches thick Some thirty feet still lower, there are in the adjoining *forty* or in the S. E. ¼ of S. E. ¼ of S. 13, T. 20, R. 9 W., some old surface diggings into an out-cropping of coal that is said to be two feet thick. This coal is believed to be (45) of the *General Section.* Its coal gave on analysis the following results :

Specific Gravity	1.311
Sulphur	.660
Moisture	2.513
Volatile Matter	31.977
Fixed Carbon	60.033
Ash	5.477
	100.000

Near Mr. Jim Battle's Spring, in the N. W. ¼ of N. W. ¼ of S. 12, T. 20, R. 9 W., there is the following out-cropping :

Out-Cropping near Mr. Jim Battle's Spring,
in the N. W. ¼ of N. W. ¼ of S. 12, T. 20, R. 9 W.

(8)	*Conglomerate*; ferruginous, seemingly of the drift.	
(7)	*Clay Slate*; with streaks of coal in the lower two to three feet	6 ft. to 7 ft. 0 in.
(6)	COAL SMUT	1 ft. 2 in.
(5)	*Clay Slate*	3 in.
(4)	COAL	3½ in.
(3)	*Clay Slate*	1 in.
(2)	COAL	3 in.
(1)	*Clay Slate*	3 ft. 0 in.

This out-cropping is some forty to fifty feet below the top of the divide and is doubtless of the same seam, (47) of the *General Section*, as the out-croppings in the N. W. ¼ of N. W. ¼ of S. 19 and the S. W. ¼ of S. W. ¼ of S. 18, T. 20, R. 8 W.

In the Water-Melon road on the side of the hill, in the S. W. ¼ of S. 9, T. 20, R. 9 W., there is much ferruginous conglomerate and sandstone which resembles very much the drift, though it is believed to be of the conglomerates, etc., between (47) and (48) of the *General Section.*

On the waters of a prong of Little Yellow Creek, which are but little depressed below the general level of the country, in S. 34, T. 19, R. 9 W., there are near the heads of the little hollows and ravines, numerous out-croppings of two seams of coal which are believed to be (47) and (48) of the *General Section*, along their north-western limits. The *Deeson Coal Beds* are surface diggings into the out-crops of the lower of these two seams, in the S. E. ¼ of S. E. ¼ of S. 34, T. 19, R. 9 W. At the *Deeson Beds*, there is about the following out-cropping :

Out-Cropping at the "Deeson Coal Beds,"
in the S. E. ¼ of S. E. ¼ of S 34, T. 19, R. 9 W.

(3)	*Conglomerate;* bluffy	1 ft. 0 in.
(2)	*Shale*; bluish, about	3 ft. 0 in.

(1)	COAL; said to have a parting about three-fourths of an inch thick, near the center, of black fossliferous shale, reported	1 ft. 10 in.

About 400 yards NWN. of these beds and some thirty feet above them, there are other old coal pits which are likely in the upper seam. Of about the same level as these last pits, there are others about one-fourth of a mile N. 10° W. and 200 yards N. W. of the *Deeson Beds*, likely in the same upper seam. About one-fourth of a mile WNW. and S. W. of the *Deeson Beds*, there are out-croppings which are believed to be of the lower of the two seams or of the same seam as the *Deeson Beds.*

The *Rose Coal Beds*, in the S. W. ¼ of S. 2, T. 20, R. 9 W., are in the out-croppings of the same seam as the *Deeson Beds*, (47) of the *General Section.* At the *Rose Coal Beds*, there is about the following out-cropping:

Out-Cropping at the "Rose Coal Beds,"
in the S. W. ¼ of S. 2, T. 20, R. 9 W.

(9)	*Conglomerate*; massive, the pebbles are few, about	15 ft. 0 in.
(8)	*Debris*	8 ft. 0 in.
(7)	*Slate*; visible	3 ft. 0 in.
(6)	COAL; about	2 in.
(5)	*Slate*	streak.
(4)	COAL	1 ft. 0 in.
(3)	*Black Slate*	1 in.
(2)	COAL	6 in.
(1)	*Slate*; bluish, just visible, may be a parting.	

The rank growth of ferns, etc., near the heads of the hollows and ravines, points to the out-croppings of a coal seam about forty feet above the one of the *Rose Coal Beds.* This upper seam would be of (48) or (49) of the *Genral Section.*

On the head waters of Turkey Creek, in the N. E. ¼ of S. 5, T. 19, R. 9 W., there are out-croppings of coal which are doubtless of the *University Seam*, (43) of the *General Section*, about as follows:

Out-Croppings on Turkey Creek, in the N. E. ¼ of S. 5, T. 19, R. 9 W.

(8)	*Debris.*	
(7)	*Shale*; visible about	3 ft. 0 in.
(6)	COAL	7½ in.
	Slate; grayish, about	¾ in.
	COAL;	2 ft. 0 in.
(5)	*Clay Slate*; just visible.	
(4)	*Debris;* about	5 ft. 0 in.
(3)	*Slate;* visible about	5 ft. 0 in.
(2)	COAL; from	1 ft. 1 in. to 1 ft. 4 in.
(1)	*Black Slate* or *Shale;* bottom.	

The *upper* and *lower benches* or (6) and (2) of the above section are here separated by about ten feet of strata. At the rest of these out-croppings, the *upper bench* shows about as follows:

Out-Cropping in the N. E. ¼ of S. 5, T. 19, R. 9 W.

(5)	*Soil;* orange color, cover.	
(4)	COAL; from	9½ in. to 0 ft. 10 in.
(3)	*Slate;* from	2 in. to 0 ft. 3½ in.
(2)	COAL; from	1 ft. 6 in. to 1 ft. 8 in.
(1)	*Clay Slate;* underbed	3 ft. 0 in.

These out-croppings are in waves from north-east to south-west.

About three-fourths of a mile south-west of the above out-croppings and on about forty feet higher ground, the growth of ferns, etc., in the heads of the hollows indicate the out-croppings of a seam of coal.

The *upper group* of this University Seam of coal, (43) of the *General Section*, also crops out about one and one-half miles SES. of the above out-croppings or in the S. W. ¼ of S. 9, T. 19, R. 9 W., where it is separated by a clay slate parting into two benches. The *upper* bench, about ten inches thick, is slaty and shaly and is of no value; the *lower bench* is from twenty to twenty-two inches thick and has been pronounced by the neighborhood blacksmiths to be of a very good quality.

Near Mr. Prince Christian's in S. 14, T. 19, R. 9 W., there is said to be an out-cropping of coal fourteen inches thick. It is believed to be (45) of the *General Section.* The following analysis of this coal is taken from the Geological Report for 1879-1880 :

Specific Gravity	1.317
Sulphur	.608
Moisture	2.179
Volatile Matter	32.855
Fixed Carbon	59.820
Ash	5.146
	100.000

On a branch in the N. W. ¼ of S E. ¼ of S. 13, T. 19, R. 9 W., near Mr. Crane Robinson's, some 150 feet below the general level of the country and about 325 feet above the river, there are some old pits into an out-cropping of coal which is thought by Mr. Robinson to be about twelve inches thick. This out-cropping of coal is about five feet under a bluff of massive conglomerates, full of pebbles about ten feet thick, with debris between the coal and bluff. This coal is believed to be of (47) of the *General Section.*

In the river in the S. E. ¼ of S. E. ¼ of S. 18, T. 19, R. 8 W. or just under the rocks which form Fair Shoals, there is said to be an out-cropping of coal, which is likely of (31) of the *General Section.*

On the side of the Water-melon road as it descends to Bone Creek, near the center of S. 12, T. 19, R. 9 W., there is an out-cropping of coal as in *Section* (1) below :

Out-Croppings on the Water-melon Road,
Near the Center of S. 12, T. 19, R. 9 W.

		(1)	(2)
(8)	*Loose Ferruginous Conglomerates.*		
(7)	*Shale;* visible	3 ft. 0 in.	
(6)	COAL	1 ft. 2 in.	1 ft. 2 in.
(5)	*Slate*	6 in.	6 in.
(4)	COAL	8 in.	1½ in.
(3)	*Slate*	1½ in.	3 in.
(2)	COAL	6½ in.	4 in.
(1)	*Clay Slate.*		

Section (2) is taken from the Geological Report for 1879-1880 and is doubtless of the same out-cropping as *Section* (1). The lower ferruginous conglomerate that is scattered over the side of the hill above this coal out-cropping is of the Drift. This coal is of (43) of the *General Section.* It has a vertical flaggy or *face and butt* structure and in the above out-cropping seems to be dipping to the north-west.

In a branch in the N. W. ¼ of S. E. ¼ of S. 7, T. 19, R. 8 W., there is an out-cropping of coal, visible to a thickness of about twelve inches. Some thirty feet above this coal, with debris, loose rock, etc., between, there sets in a massive conglomerate bluff about ten feet high. This coal is believed to be of (38) of the *General Section.*

On Panther Branch in the S. W. ¼ of S. W. ¼ of S. 5, T. 19, R. 8 W., there is the following out-cropping :

Out-Cropping on Panther Branch,
in the N. W. ¼ of S. E. ¼ of S. 7, T. 19, R. 8 W.

(7)	*Shale*; hard, with seams of flagstones	8 ft. 0 in.
(6)	COAL; shaly, with slaty streaks in places.	11 in. to 1 ft. 0 in.
(5)	*Slate*	3½ in.
(4)	COAL; slaty	¼ in.
(3)	*Slate*	4 in.
(2)	COAL; slaty and rusty	1 in.
(1)	*Slate;* hard visible	6 in.

The following analysis from the Geological Report for 1879-1880, is of the coal in an out-cropping on Panther Branch near its mouth which is more than likely of the same seam as that of the above section, (30) of the *General Section :*

Specific Gravity	1.329
Sulphur	.835
Moisture	.778
Volatile Matter	33.271
Fixed Carbon	61.082
Ash	4.869
	100.000

In a deep ravine in the N. W. ¼ of S. E. ¼ of S. 36, T. 18, R. 9 W., there is the following out-cropping:

Out-Cropping in the N. W. ¼ of S. E. ¼ of S. 36, T. 18, R. 9 W.

(6)	*Sandstone*; massive and slabby.	
(5)	*Slate*	2 ft. 0 in.
(4)	COAL	8 in.
(3)	*Slate*	½ in.
(2)	COAL	6 in.
(1)	*Slate*; may be a parting.	

This out-cropping is believed to be of (38) of the *General Section.*

Along Blue Creek in the south-west part of T. 18, R. 8 W. and the south-east part of T. 18, R. 9 W., there are numerous comparatively thin out-croppings of coal which are believed to be of (30) to (39), inclusive, of the *General Section.*

In a ravine in the N. W. ¼ of N. W. ¼ of S. 32, T. 18, R. 8 W., there is an out-cropping of coal which is said to be from ten to twelve inches thick. It is perhaps of (34) of the *General Section.*

The following analysis is given in the Geological Report for 1879-1880 of a sample of coal which is believed to be of this very out-cropping:

Specific Gravity	1.282
Sulphur	.798
Moisture	2.391
Volatile Matter	33.865
Fixed Carbon	59.069
Ash	4.675
	100.000

On the side of the divide nearly 200 feet above this coal out-cropping, there is a bluff of massive conglomerates from ten to fifteen feet thick, and some sixty feet below the above out-cropping of coal, there is in Blue Creek in the S. E. ¼ of S. W. ¼ of S. 29, T. 18, R. 8 W., an out-cropping, three inches in thickness, of coal, over slate which may be a parting. Between these last two out-croppings of coal, there are some loose massive conglomerates, which are believed to be of those between (31) and (32) of the *General Section.*

About 300 yards north-west of Mr. A. McMillan's or in the N. W. ¼ of S. W. ¼ of S. 29, T. 18, R. 8 W., there is an out-cropping of coal smut about ten inches thick, which is likely of the same seam as the upper one of the two coal out-crops just mentioned.

In the S. W. ¼ of S. E. ¼ of S. 30, T. 18, R. 8 W., there is in a ravine just to the east of the Water-Melon road, the following out-cropping :

Out-Cropping in the S. W. ¼ of S. E. ¼ of S. 30, T. 18, R. 8 W.

(3)	*Conglomerates*	8 ft. 0 in.
(2)	COAL; hard and rusty	10½ in.
(1)	*Slate*; visible	1 ft. 6 in.

This coal is of (38) of the *General Section.*

On the side of the hill in the Water-Melon road just north of Blue Creek and some sixty feet above the creek, there is the following badly exposed out-crop :

Out-Cropping in the Water-Melon Road,
in the S. W. ¼ of N. E. ¼ of S. 30, T. 18, R. 8 W.

(5)	*Debris;* clayey soil.	
(4)	COAL SMUT	4 in
(3)	*Slate*	8 ft. 0 in.
(2)	COAL SMUT	8 in.
(1)	*Clay Slate.*	

This out-cropping is possibly of (33) of the *General Section.*

At a deer lick, in the S. W. ¼ of S. E. ¼ of S. 19, T. 18 R. 8 W., some eighty feet above Blue Creek, there is an out-cropping of a seam of coal from ten to eleven inches thick. It is believed to be of (34) of the *General Section.*

In the Water-Melon road, in the N. W. ¼ of N. E. ¼ of S. 20, T. 18, R. 8 W. near the top of the divide between Blue and Yellow creeks, some 300 feet above Blue Creek, there is a thin out-cropping of coal over fire clay and under shale.

Blue Creek seems to be about a divide between a growth principally of pines on the south and of oaks and hickory on the north or of out-crops of strata of a more sandy nature, principally sandstones, on the south and those of a more clayey nature, principally shales, on the north. These shales must be about 300 feet thick, and are barren of coal so far as is known in this county.

On a branch in the S. W. ¼ of N. E. ¼ of S. 25, T. 19, R. 9 W., there is said to be an out-cropping of coal about one foot in thickness. On an other branch in the N. E. ¼ of S. E. ¼ of S. 15, T. 18, R. 9 W., some fifty feet above Blue Creek, there is an out-cropping of coal about seven inches thick.

At the crossing of Little Blue Creek by the Winton Dunn road, in S. 27, T. 18, R. 9 W., there is an out-cropping of coal for seventy-five to 100 yards along the road, that is known as the "*Hamner Coal Bed.*" At this bed there occurs about the following out-croppings:

Out-Cropping at the "Hamner Coal Bed,"
in S. 27, T. 18, R. 9 W.

		(1)	(2)
(8)	*Shale.*		
(7)	*Shale*; hard, visible	6 ft. 0 in	10 ft. 0 in.
(6)	Coal	3 in.	Coal; hard 10½ in.
(5)	*Slate*; black, shaly	⅛ in.	
(4)	Coal	8 in.	
(3)	*Slate;* bluish	1¾ in	2 in.
(2)	Coal; cubical	1½ in	2 in.
(1)	*Slate;* hard, bluish.		

In the road on the side of the hill some 300 yards WSW. of the "*Hamner Bed*" and doubtless thirty feet above it, there is an out-cropping of coal smut, a few feet under a bluff of massive coarse grain sandstone.

At *Ned Christian's Coal Bed*, in S. 10, T. 18, R. 9 W., there is about the following out-cropping:

Out-Cropping at "Ned Christian's Coal Bed,"
in the N. E. ¼ of S. 10, T. 18, R. 9 W.

(6)	*Shale, Debris.*	
(5)	Coal Smut	5 in.

(4)	*Slate*	4 ft. 0 in.
(3)	Coal Smut	6 in.
(2)	*Slate*; with streaks of *black band*	5 ft. 0 in.
(1)	Coal; visible down to a thickness of	8 in.

This out-cropping is probably of (33) of the *General Section.*

On the north prong of Clifty Creek, a branch of Big Yellow Creek, in the S. ½ of N. E. ¼ of S. 20, T. 17, R. 8 W., there are several out-crops of (33) of the *General Section*, about as follows :

Out-Croppings in the S. ½ of N. E. ¼ of S. 20, T. 17, R. 8 W.

		(1)	(2)	(3)	(4)
(9)	*Shale*; cover.				
(8)	Coal	7 in.	7½ in.	4 in.	5 in.
(7)	*Slate*	1½ in.	4½ in.	1 in.	2½ in.
(6)	Coal	4 in.	6½ in.	4 in.	2 in.
(5)	*Slate*	⅛ in.	2 in.	2½ in.	visible. 2 in.
(4)	Coal	2½ in.	8 in.	9 in.	
(3)	*Fire Clay*	6 in.	4 in.	6 in.	
(2)	Coal	6 in.	9 in.	7 in.	
(1)	*Fire Clay;* underbed.				

No. 1 is in the back of a rock-house, in the S. W. ¼ of N. E. ¼ of S. 20, T. 17, R. 8 W.

No. 2 is down the Creek about 175 yards ENE of *No.* 1.

No. 3 is on a branch about one-fourth of a mile ENE. of *No.* 2 or in the S. E. ¼ of N. E. ¼ of S. 20, T. 17, R. 8 W.

No. 4 is on an other branch about one-fourth of a mile NEN. of *No.* 3 ; it does not show the full thickness of the seam.

The shale cover is hard, curly and gritty, and is about six feet thick to an over-lying massive and flaggy sandstone which is from thirty to forty feet thick. The coal (8) of these sections has streaks of slate in places, as well as (6), and the coal (4) shows a flaggy structure. These out-crops have a dip of 10° to 12° to the south-east.

In *Coal Spring*, in the N. W. ¼ of S. W. ¼ of S. 23, T. 17 R. 8 W., there is an out-cropping of coal about six inches in thickness, which is about 100 feet higher than the above coal out-croppings on Clifty Creek. It is probably of (36) or (37) of the *General Section.*

In Mr. Wm. W. Simpson's spring, in the S. E. ¼ of N. W. ¼ of S. 13, T. 17, R. 8 W. seemingly some 150 feet above the last coal out-cropping and hence about 250 feet above the coal on Clifty Creek, there is the following out-cropping:

Out-Cropping at Mr. W. E. Simpson's Spring,
in the S. E. ¼ of N. W. ¼ of S. 13, T. 17, R. 8 W.

(15)	*Sandstone*; massive.	
(14)	*Debris*	4 ft. 0 in.
(13)	*Shale*; visible	2 ft. 0 in.
(12)	COAL	1 in.
(11)	*Slate*	1½ in.
(10)	COAL	6 in.
(9)	*Slate*	1 in.
(8)	COAL	5 in.
(7)	*Slate*	5 in.
(6)	COAL	5 in.
(5)	*Slate*	1 in.
(4)	COAL	9 in.
(3)	*Slate*	½ in.
(2)	COAL	½ in.
(1)	*Sandstones.*	

This out-cropping is believed to be of (43) of the *General Section*; it seems to dip to the north-west.

In a hollow some 300 yards east of this last coal out-crorpping and some sixty feet lower, there is an other out-cropping of coal.

In the bed of Indian Creek in Mr. Gant's field, in the N. E. ¼ of S. W. ¼ of S. 1, T. 17, R. 8 W., there is an out-cropping of coal that is said to have been dug down into to a depth of, at least, one foot; it is a good hard coal and is probably of (31) of the *General Section.* About 150 yards farther up the creek, a part of this same seam shows as follows:

Out-Cropping in Indian Creek,
in the N. E. ¼ of S. W. ¼ of S. 1, T. 17, R. 8 W.

(6)	*Debris.*	
(5)	*Slate*; visible	2 in.
(4)	Coal	3 in.
(3)	*Slate*	2 in.
(2)	Coal	½ in.
(1)	*Slate;* just visible.	

In the bed of a branch, in the S E. ¼ of S. E. ¼ of S. 2, T. 17, R. 8 W., there is on out-cropping of very hard coal about six inches thick. It contains much pyrites and has a cover of slabby sandstone. It dips to the south-east. Farther down the branch, or in the N. E. ¼ of S. W. ¼ of S. 1, T. 17, R. 8 W., and some twenty feet lower, there is an other out-cropping of coal which is thought to be of a thicker seam, and on the side of the road some twenty-five to thirty feet above this last out-cropping of coal, there is a showing of coal smut about thirty inches thick. It seems to have a parting of slate and is believed to be of (33) of the *General Section.*

In a branch near Mr. William M. Kilgore's or in the S. E. ¼ of N. E. ¼ of S. 5, T. 17, R. 8 W., there is an out-cropping of coal that is covered for five to six feet with a bluish shale and then by a massive sandstone.

Mr. W. A. Hagler, in the N. E. ¼ of N. E. ¼ of S. 34, T. 17, R. 9 W., has a spring of strong chalybeate water, and in some of the flat flagstones higher up the ravine than the spring there are some smooth round holes which look as if they might have been once used as mortars. Some seventy-five feet higher than the above spring, there is said to be a thin seam of coal which crops out in Mrs. Sander's well.

The water of *Wyndham Spring,* in the N. E. ¼ of S. 8, T. 18, R. 9 W., is a moderately strong sulphur water, quite pleasant to the taste. Years ago, before there was any Alabama Great Southern Railroad, this spring was quite popular as a summer resort for the citizens of Tuscaloosa and adjoining counties, and its water was then well thought of for its medicinal virtues. This spring more than likely has its origin in a seam of coal. An out-cropping of coal, six inches thick, occurs in the branch just above the spring, and in the branch just below the spring, there is said to be an other out-cropping of coal. In a branch about one-half mile east of the spring, there is an out-cropping of coal which is perhaps of the same seam as the upper one above the spring. The strata hereabouts are in waves, though the general dip is to the south-east.

Between Wyndham Spring and Mr. W. A. Hagler's, there are but few bedded strata to be seen along the road and the growth consists principally of the different kinds of oak with some short leaf pine, hickory, gum, poplar, etc.

At Bethlehem Church spring, near the center of S. 22, T. 17, R. 10 W., there is an out-cropping of coal that was felt down to a thickness of about fourteen inches without being able to reach the bottom. It is covered by a massive micaceous sandstone. At an other spring in the north-east corner of S. 3, T. 18, R. 10 W., there is an out-cropping of a coal seam about twelve inches thick and at Miller's Spring, in the S. E. ¼ of N. E. ¼ of S. 3, T. 18, R. 10 W., there is an other coal out-cropping of about the same thickness. In a well about 300 yards north of this last spring, there is said to be a seam of coal which is doubtless of the same seam as the coal at Miller's spring. These coals are believed to be of (31) of the *General Section.*

North River, in the N. E. ¼ of S. 4, T. 18, R. 10 W., bends around on itself and encloses about 200 acres in what is known as *the pocket.* The neck of this pocket is not more than 200 yards wide, and its highest point is about thirty feet above low water in the river. The river in its course around this pocket has a fall of seven to eight feet and it has been proposed to cut a *race* across this neck and erect a mill on the lower side.

The *Collins Coal Bed* is of an out-cropping in a deep hole in the bed of a branch in the S. W. ¼ of N. W. ¼ of S. 9, T. 18, R. 10 W. The coal of this bed is of a flaggy structure and is said to be fourteen inches thick. Large lumps of coal of over a foot in thickness have been broken off and washed up from this out-cropping by the high waters. A bluff of sandstone sets in a few feet above this out-cropping of coal.

The *Salt Spring*, in the N. E. corner of S. 16, T. 18, R. 10 W., rises under the above bluff of sandstone and it is believed, in a covered out-cropping of the same coal seam, thought to be (30) of the *General Section*, as crops out in the *Collins' coal bed.* This spring gets its name from the fact that its water is of a salime character and was made to yield some little salt during the late war.

The Maverick or Coyle Coal Bed in the S. W. ¼ of S. W. ¼ of S. 8, T. 18, R. 10 W. is said to be in an out-cropping of coal that is eight inches thick.

In North River in the N. E. ¼ of S. 16, T. 18, R. 10 W., there is an out-cropping of coal about fourteen inches thick in which the upper and lower halves are of entirely different coals. This coal is likely of the same seam as the *Collins' bed*, (30) of the *General Section.*

In a ditch about 200 yards west of Mr. J. H. Walton's, or in the N. E. ¼ of N. W. ¼ of S. 15, T. 18, R. 10 W., there is an out-cropping of coal about eight inches thick with an underbed of fire clay and a cover of flagstones. South-east of this out-cropping some 300 yards and about twenty-five feet lower there is an other out-cropping of coal in which there are some old coal pits that were dug a good many years ago. These out-crops are probably of (32) and (31) of the *General Section.*

In a spring in the S. E. corner of the S. W. ¼ of S. 10, T. 18, R. 10 W., there is an out-cropping of coal about four inches thick with a cover of sandstone and an underbed of clay. About 300 yards east of this spring and some twenty feet lower, there is the following out-cropping at the spring at the *old Nix place:*

Out-Cropping at the "Old Nix Place" Spring, in the S. W. ¼ of S. E. ¼ of S. 10, T. 18, R. 10 W.

(6)	*Sandstone*; massive	4 ft. 0 in.
(5)	COAL; slaty	3 in.
(4)	*Black Shale with streaks of* COAL	3 in.
(2)	COAL; cubical	6 in.
(1)	*Clay Slate;* visible	2 ft. 0 in.

This same seam of coal crops out in the road about seventy-five yards north of the above spring, and about 100 yards still farther down the road to the south-east, there is an other out-cropping, it is believed to be of this same seam. Still farther down the road to the south-east, about seventy-five yards and about fifteen feet lower, there is the following out-cropping:

Out-Cropping in the Waldrops Road,
in the S. W. ¼ of S. E. ¼ of S. 10, T. 18, R. 10 W.

(5)	*Shale.*	
(4)	*Clay*; with streak of *coal smut* near the top	1 ft. 6 in.
(3)	COAL SMUT	10 in.
(2)	*Slate*; ferruginous	1½ in.
(1)	*Clay Slate*	6 in.

These out-croppings of coal in the Waldrops road are believed to be of (32) and (33) of the *General Section.*

There is an out-cropping of the conglomerate between (31) and (32) of the *General Section*, in the bluff on the side of the hill above Mr. J. H. Walton's Spring, in the N. E. ¼ of N. W. ¼ S. 15, T. 18, R. 10 W. No large pebbles were seen in these conglomerates. From fifteen to twenty feet below these conglomerates, there is at Mr. J. H. Walton's old mill site, on Cripple Creek, a rock quarry in an out-cropping of beautiful flagstones.

At the Widow Jones' Spring, in the N. E. ¼ of N. E. ¼ of S. 15, T. 18, R. 10 W., there is an out-cropping of coal which was visible to a thickness of six to seven inches over an underbed of fire clay.

The *W. C. Waldrop's Coal Bed*, in the S. E. ¼ of S. 12, T. 18, R. 10 W., is an out-cropping of coal that is said to be eighteen inches thick. It is likely of (33) of the *General Section.*

In the Waldrop's road, in the N. E. ¼ of N. W. ¼ of S. 12, T. 18, R. 10 W., there is an out-cropping of coal smut about six inches thick and in the N. E. ¼ of N. W. ¼ of S. 22, T. 18, R. 10 W., there are some old coal pits from which considerable coal has been raised.

In Squire Beaver's well, in the S. W. ¼ of S. E. ¼ of S. 22,

T. 18, R. 10 W., there is said to be some sixteen feet below the surface a seam of coal twelve inches thick. This same seam crops out on a branch in the same *forty* as the well, about as follows:

Out-Cropping in the S. W. ¼ of S. E. ¼ of S. 22, T. 18, R. 10 W.

(7)	*Shale*; massive, curly, showing	6 ft. 0 in.
(6)	COAL; in blocks	3 in.
(5)	*Slate*; gray	3 in.
(4)	COAL; cubical, slaty in places	2 in.
(3)	*Slate*; gray	3 in.
(2)	COAL; in blocks	8 in.
(1)	*Slate*.	

This out-cropping is of (31) of the *General Section.*

The conglomerate between (31) and (32) of the *General Section*, shows in the Waldrop's road near the crossing of Cripple Creek. In the S. E. ¼ of N. E. ¼ of S. 21, T. 18, R. 10 W., are some old coal beds or surface diggings which are doubtless in an out-cropping of this same seam, (31) of the *General Section.* The cover to the coal in these old beds is a massive micaceous carbonaceous sandstone with plant impressions. In the river, in the S. W. ¼ of N. E. ¼ of S. 21, T. 18, R. 10 W., there is said to be an out-cropping of coal twenty inches thick which is very likely of (30) of the *General Section.* Some eight to ten feet above this coal in the river, there sets in a bluff of massive micaceous carbonaceous sandstone, dipping to the south-east. Still higher up the river about one-fourth of a mile or in the S. E. ¼ of N. W. ¼ of S. 21, T. 18, R. 10 W., there is said to be an other out-cropping of coal in the river about twenty inches thick; it is likely of the same seam.

Near Mr. Simpson's, in the S. W. ¼ of N. W. ¼ of S. 21, T. 18, R. 10 W., there is an out-cropping of coal about twelve inches thick, over and under slate. North-east from this out-cropping about 200 yards, is Mr. Simpson's well, in which there is said to be the following section:

Section in Mr. Simpson's Well, in the S. W. ¼ of N. W. ¼ of S. 21, T. 18, R. 10 W.

(4)	*Slate.*	
(3)	COAL; about	1 ft. 0 in.
(2)	*Slate*	3 in.
(1)	COAL; about	1 ft. 6 in.

This coal is believed to be of (33) of the *General Section.*

At a spring in the S. W. corner of the S. E. ¼ of N. W. ¼ of S. 1, T. 19, R 10 W., there is the following out-cropping:

Out-Cropping in the S. W. corner of the S. E. ¼ of N. W. ¼ of S. 1, T. 19, R. 10 W.

(4)	*Sandstone.*	
(3)	COAL; good and hard	1 ft. 7 in.
(2)	*Fire Clay*	5 in.
(1)	*Sandstone*	

This coal is believed to be of (43) of the *General Section.*

Some fifteen feet above this out-cropping of coal, there is some ferruginous conglomerates which are believed to be of the Coal Measures, though they resemble the Drift, and under them there is thought to be a seam of coal. North-east of this out-cropping about one-half of a mile, there is said to be a showing of coal on the side of a hill.

In Turkey Creek just below the Walton road ford, in the S. E. ¼ of S. E. ¼ of S. 15, T. 19, R. 9 W., there is an out-cropping of coal with the following reported section:

Coal Out-Cropping in Turkey Creek, in the N. E. ¼ of N. E. ¼ of S. 15, T. 19, R. 9 W.

(3)	COAL	2 in.
(2)	*Slate*	2 in.
(1)	COAL	1 ft. 1 in.

This coal is believed to be of (38) of the *General Section.*

The strata near this out-cropping appears to dip to the north-west, hence they must be in waves.

In the old Byler road, in the S. E. ¼ of S. E. ¼ of S. 20, T. 19, R. 10 W., about 400 yards south of Mr. E. I. Hagler's

Mill on Bunion Creek, there is an out-cropping of good pure coal about fourteen inches thick, over and under slate. In a branch about 300 yards west of Mr. Hagler's Mill and thirty-five to forty feet under the above coal out-cropping in the road, there is an out-cropping of coal from eight to nine inches thick which is said to be a very fine black-smith coal. This same seam of coal crops out from under a bank just above the mill, where it is eight inches thick. About forty feet under this last seam of coal, there is a seam of coal which crops out in the banks of Bunion Creek, just below and under Mr. Hagler's Mill, in the N. W. ¼ of S. E. ¼ of S. 20, T. 19, R. 10 W., as follows:

Out-Cropping in the Banks of Bunion Creek, under E. I. Hagler's Mill, in the N. W. ¼ of S. E. ¼ of S. 20, T. 19, R. 10 W.

(13)	*Shale*; visible	12 ft. 0 in.
(12)	COAL; rusty	2 in.
(11)	*Slate*	3 in.
(10)	COAL; rusty	1 in.
(9)	*Slate*	1½ in.
(8)	COAL	2½ in.
(7)	*Slate*	1 in. to 1 ft. 0 in.
(6)	COAL	1½ in.
(5)	*Slate*	0 to 0 ft. 1 in.
(4)	COAL	11 in.
(3)	*Slate*	0 to 0 ft. ½ in.
(2)	COAL	2 in.
(1)	*Slate*; with *sigilaria*, visible	4 ft. 0 in.

There are therefore the out-croppings of three seams of coal near Mr. E. I. Hagler's Mill, as follows:

Out-Cropping near Mr. E. J. Hagler's Mill, in the S. E. ¼ of S. 20, T. 19, R. 10 W.

	Measures; shales.	
(3)	COAL; (40) of the *General Section*	1 ft. 2 in.
	Measures; about	40 ft. 0 in.
(2)	COAL; (39) of the *General Section*	8 in.
	Measures; about	40 ft. 0 in.
(1)	COAL; (38) of the *General Section*	2 ft. 0 in.
	Measures; shales.	

These out-crops are in waves from north-west to south-east, though they have a general dip to the south-east. Mr. Hagler's mill is about 350 yards above the mouth of Bunion Creek or from the river. The creek in this distance is said to have a fall of three feet and in the banks of the river along the edge of the water just below the mouth of this creek, there are several out-croppings of the coal (1) of the above section. One of these out-croppings is about as follows:

Out-Cropping in the West Bank of North River, in the N. E. ¼ of S. E. ¼ of S. 20, T. 19, R. 10 W.

(13)	*Shale.*	
(12)	*Flagstone*	2 in.
(11)	*Shale*	3 ft. 0 in.
(10)	COAL	1½ in.
(9)	*Slate*; bluish	1½ in
(8)	COAL	1 in.
(7)	*Slate*	4 in.
(6)	COAL	1½ in.
(5)	*Slate*	½ in.
(4)	COAL	9 in.
(3)	*Slate*	1 in.
(2)	COAL	2 in.
(7)	*Slate*; bluish, visible	3 ft. 0 in.

About seventy-five yards farther down the river, there occurs under the fish-trap the following out-cropping of the lower part of the above seam:

Out-Cropping in the West Bank of North River, Under the Fish-Trap, in the N. E. ¼ of S. E. ¼ of S. 20, T. 19, R. 10 W.

(4)	*Slate*; visible	3 ft. 0 in.
(3)	COAL	9 in.
(2)	*Slate*	½ in.
(1)	COAL; cubical	2 in.

The coals of this section corresponds to that of (4) and (2) of the preceding section and are doubtless the same, hence the upper part of the seam at this last out-cropping has split off from the lower part and does not show in the out-cropping. There is said to be an out-cropping of coal in the river just below the fish-trap; it is doubtless of this slaty seam which is here in waves from north-west to south-east.

In the S. E. ¼ of N. W. ¼ of S. 21, T. 19, R. 10 W., there is a rock quarry in an out-cropping of beautiful thick flag-stones, and in the S. W. ¼ of N. E. ¼ of S. 21, T. 19, R. 10 W., there is a quarry in an out-cropping of beautiful thin flag-stones, such as are called *plank rocks.*

On the land of Lem Pruit, colored, in the N. E. ¼ of S. W. ¼ of S. 27, T. 19, R. 10 W., there is in the bed of a branch an out-cropping of coal that has here been considerably surface dug; it is said to be sixteen inches thick and is most likely of (40) of the *General Section.* Nearly one-half mile south of this out-cropping, there is said to be an out-cropping of coal in North River. This coal is probably of (39) of the *General Section.*

In the banks of North River, just above low water level, in the N. E. corner of S. E. ¼ of S. 34, T. 19, R. 10 W., there is an out-cropping of coal about six inches thick. It is probably (39) of the *General Section.* This same seam of coal, perhaps, crops out just above and below low water level in the river about one-half mile below the bridge on the Crab road or in the S. W. ¼ of S. E. ¼ of S. 35, T. 19, R. 10 W., as follows:

Out-Cropping in Banks of North River, in the S. W. ¼ of S. E. ¼ of S. 35, T. 19, *R.* 10 W.

(5) *Shale*; visible	4 ft. 0 in.
(4) COAL; with a streak of slate about one inch from the top, about	1 ft. 0 in.
(3) *Slate*; under level of low water, about	1 ft. 0 in.
(2) COAL	4 in.
(1) *Slate*; may be a parting.	

This out-cropping is believed to be of (39) of the *General Section.*

Under a high bluff of shale, there is, on a branch in the N. W. ¼ of N. E. ¼ of S. 35, T. 19, R. 10 W., an out-cropping of coal about eight inches thick; it is likely of (41) of the *General Section.* South-east of this last coal out-cropping several hundred yards, though in the same *forty*, and some ten feet lower, there is in Dorsey Creek, just below P. T. Chamber's Mill, a reported out-cropping of coal which is doubtless of the same seam. Higher up on Dorsey Creek, in the S. W. corner of S. 25, T. 19, R. 10 W., there is an out-cropping of coal that has been considerably surface dug by the neighborhood blacksmiths. At this coal bed, there is about the following out-cropping:

Out-Cropping on Dorsey Creek,
in the S. W. Corner of S. 25, T. 19, R. 10 W.

(7)	*Shale, Debris*; about	100 ft. 0 in.
(6)	*Shale*; bluff	60 ft. 0 in.
(5)	*Debris*	8 ft. 0 in.
(4)	COAL	1 in.
(3)	*Slate*	$\frac{1}{2}$ in.
(2)	COAL; reported	8 in.
(1)	*Slate*; reported	8 in.

This coal out-cropping is probably of (43) of the *General Section*.

North of North-port to North River, the Coal Measures are everywhere hid by the over lying Drift, except along the water courses.

We have seen out-croppings of coal in the following *Sections* in Tuscaloosa county:

S's, 1, 2, 5, 13, 14, 16, 20, 23	T. 17,	R. 8 W.
" 8, 22	" 17,	" 10 "
" 19, 20, 25 29, 30, 31, 32, 36	" 18,	" 8 "
" 8, 10, 15, 25, 27, 28, 34, 36	" 18,	" 9 "
" 3, 8, 9, 10, 12, 14, 15, 16, 20, 21, 22	" 18,	" 10 "
" 31, 32	" 19,	" 6 "
" 3, 4, 5, 7, 17, 27, 29, 30 32, 35, 36	" 19,	" 7 "
" 2, 3, 5, 7, 9, 10, 11, 15, 18, 29, 32	" 19,	" 8 "
" 5, 9, 10, 12, 13, 14, 15, 21, 23, 25, 34,	" 19,	" 9 "
" 1, 3, 15, 20, 25. 27, 34, 35	" 19,	" 10 "
" 5, 8, 10, 11, 14, 17, 18, 19, 20, 22, 23, 28, 31	" 20,	" 6 "
" 2, 5, 7, 8, 10, 13, 18, 19, 20, 21, 23, 25, 28, 29, 31, 32, 33, 36	" 20,	" 7 "
" 2, 5, 6, 10, 16, 18, 19, 20, 21, 26, 27, 28, 29, 30, 32, 33, 34, 35, 36	" 20,	" 8 W.

S's 2, 3, 7, 8, 9, 12, 13, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 35, 36	" 20,	" 9 W.
" 10, 12,	" 20,	" 10 "
" 1, 2, 3, 4, 5, 7, 11, 12, 14, 15, 16, 21, 22, 23, 31, 32,	" 21,	" 7 "
" 1, 2, 3. 4, 5, 6, 7, 8, 10, 11, 12, 19, 26, 27, 31, 32, 36	" 21,	" 8 "
" 1, 2, 3, 9, 10, 11, 12, 13, 14, 15, 16, 21, 22, 23, 24, 25, 26, 28, 36	" 21,	" 9 "
" 10, 13, 14, 15, 23, 31	" 21,	" 10 "
" 1, 2, 10, 11, 15, 22	" 22,	" 8 W.

III. THE RACCOON MOUNTAIN COAL FIELD.

As a continuation of a description of the Warrior Coal Field, we here append a report by Gen. A. M. Gibson, of Chepultepec, Blount county, Alabama, on the *Raccoon Mountain Coal Field.* As this coal field is connected with the Warrior Coal Field or is a part of the plateau or table land region of the Warrior Coal Field, a general description of it will very properly come in here. It is that part of the Warrior Coal Field which lies between Brown's Valley on the north-west and Wills' Valley on the south-east.

REPORT ON THE RACCOON MOUNTAIN COAL FIELD,

BY

GEN. A. M. GIBSON,

To Dr. Eugene A. Smith, State Geologist:

SIR:—I have the honor to herewith submit my report on the *Raccoon Mountain Coal Field*, made under your directions in the year 1883.

Very respectfully,

A. M. GIBSON.

THE RACCOON MOUNTAIN COAL FIELD is that portion of the Warrior Coal Field lying between Wills' Valley and Brown's Valley and between Canoe Creek Valley and Murphree's Valley. It is a continuation of the Raccoon Mountain Coal Field of Tennessee and extends from the Tennessee River and Georgia line, on the north-east, to Jefferson County, in Range 1 West, on the south-west. The length of this coal field in Alabama from north-east to south-west, is about ninety miles; and in breadth, it varies from five to twenty miles. Its total area approximates one thousand square miles.

The northern or upper end of this field, from the Georgia line to near the head of Bristow's Cove, in T. 10., R. 5 E., is mainly table land, generally level and will, when cleared and properly improved, present one of the most beautiful sections of the State. The mountain declines gently in a south-west direction, just enough to give direction to its streams, but not enough to cause them to deeply erode their channels. This section presents the characteristics and general Geological features of the table lands of Tennessee. From the head of Bristow's Cove south-westwardly, the mountain presents totally different features. The dip of the strata to the north-west becomes very marked; the streams trend in that direction, and from their rapid descent have deeply eroded their channels. The country is consequently much broken, while the Coal Measures have greatly thickened, and present the general features and structure of the Cahaba Coal Field. These different sections of this mountain, with features so unlike, will have to be separately described.

In the northern section of this field, there are but few exposures of coal. This is owing to the general levelness of the country and because the streams have not cut deeply into the strata. The principal portion of the country is table land, with a few ridges of harder strata that have withstood the denudation. The surface rock is the great conglomerate which so persistently accompanies the *Lower Coal Measures* throughout the whole Appalachian Coal Field. This great stratum of rock, generally from eighty to 100 feet thick, should be carefully distinguished from other conglomerates, which occur higher up in the Carboniferous Series. It is not of uniform character or structure, in some places it is a hard coarse gray or reddish sand rock, with many or few pebbles and in other places it is soft and crumbly. It however, everywhere, preserves its general characteristics and massiveness with wonderful persistency. It constitutes the cap rock of the Alleghany Mountains, of the Cumberland Mountains and of the table lands of Alabama.

It divides the *Lower Coal Measures*; i. e., they lie both below and above it. Some have designated the coals below this rock as "*lower coals*" and all those above it as "*upper coals.*" This division is liable to mislead, as the *upper coals*, properly so called, belong much higher up in the Measures. The better designation is to call the coals beneath this rock, *Sub-Conglomerate*, and those above it, belonging to the *Lower Coal Measures*, the *Super-Conglomerate Coals*.

All the coal as yet developed in this portion of the field belong to the Sub-Conglomerate class. Yet, there is every probability that Super-Conglomerate coals exist. There are a few places where the measures have not been denuded down to the Conglomerate, notably the Pea Ridge region. Here a great thickness of Super-Conglomerate strata has been left. They occupy the same Geological position as the measures of the great Sewanee Coal Seam, and it is very probable that an intelligent and persistent search for coal here, would be richly rewarded.

The Sewanee Seam is one of the most important that has yet been opened in the State of Tennessee and if its equivalent can be found in this region, it would add vastly to the value of this coal field. Unless such discoveries should yet be made, in the *Super-Conglomerate* Measures, all the mining will have to be done from the edges of the mountain, or by deep shafts penetrating through the conglomerate rock and other intervening strata.

Only one seam of coal could be clearly traced on the face of the mountain bordering Wills' Valley. The existence of an other is, however, highly probable. And at one point, Winston's Gap, it is believed to be exposed, but so broken and crumbled by a fold at that point, as to be worthless. In Lookout Mountain, on the opposite side of the valley, two seams of coal are well known, and both of them have been extensively mined. The upper one, just beneath the conglomerate rock, seems clearly to be the equivalent of the seam occupying the same Geological position in the Raccoon Mountain, though generally thicker in the latter than in the former mountain. The lower seam in the Lookout Mountain is the thicker and more important of the two, and the existence of its equivalent in the Raccoon Mountain is scarcely to be doubted. Its position will, however, be relatively much nearer the base of the mountain and its outcroppings are much more hevaily covered with debris. This results from the greater elevation of the Lookout Mountain.

Gen. Gibson gives here a general section across Wills' Valley near Valley Head, showing the positions of the coal seams in the two facing mountains, Raccoon and Lookout, on opposite sides of the valley, and of the intermediate strata of the older formations in the valley. This section also shows the presence of a fault along the north-west edge of the valley, in which a part of the Coal Measures and all of the underlying strata down to the *Black Shale* have been enveloped. We are sorry that neither the time nor the means at our command, will permit now of our giving this section. H. McC.

At a few points on the north-western side of the valley, the sub-carboniferous limestone is exposed, and at the Alabama White Sulphur Springs, in S. 11, T. 4, R. 10 E., a lower group, believed to be the St. Louis Limestone, is also exposed. There is evidently a fault near the north-western side of the valley, along which there has been a vertical displacement of several hundred feet. The *Clinton Group* and *Coal Measures* frequently are adjacent to each other, and in some places it would seem that the base of the Coal Measures is beneath the level of the valley. The difference of elevation therefore between the Lookout and Raccoon mountains, does not arise from thicker strata or thicker Coal Measures on the former, but because the latter has been faulted downward the whole depth or thickness of the Subcarboniferous strata.

It will therefore be clearly understood why the second and principal seam of coal in the Lookout Mountain, must have its counterpart lower down on the opposite side of the valley, and also why its out-crop is deeply buried beneath the accumulated detritus of Raccoon Mountain.

It will also be observed that there is in this valley two distinct anticlinals; one near the centre of the valley, which exposes the great chert beds lying beneath the *Trenton* rocks; and the other, near the western side of the valley, involving apparently only the Sub-carboniferous strata. A most beautiful illustration of it occurs at Lemly post-office, in T. 7, R. 8 E., six miles west of Fort Payne, where a magnificent spring flows out from under the arch of the anticlinal. The unbroken arch here is sub-carboniferous limestone. At other points the fold involves the *Black Shale*, but no where exposes the *Trenton* limestone. This minor fold, running as it does, close to or under the edge of the Raccoon Mountain, obscures and complicates the edge of the Coal Measures. In many places only scientific skill can insure successful mining. Among the many points where this is apparent may be mentioned the Winston Gap, already referred to, near the north-east corner of T. 7, R. 7 E., where there is a heavy bed of slate, forty to sixty feet thick, then a bed of coal apparently four feet thick but so broken and crumbled by the fold as to be worthless. A good deal of labor has been wasted here in mining without profitable results. At the Horton Gap, in S. 8, T. 10, R. 6 E., there is also a seam of coal averaging two feet thick, in nearly vertical strata, with fire clay on top apparently reversed, or the bottom on top, as can be seen from the position of the associated conglomerate, the upper bed, though now at the base of the mountain. These examples will suffice to show the nature and extent of the complications arising from this fold. There are, however, many places on the face of the mountain where the coal is in a normal condition.

Near Smith's Spring, in S. 9, T. 6, R. 9 E., at 115 feet from the top of the mountain and 280 feet above the valley, there is a bed of good solid coal two and a half to three feet thick. A good deal of coal has been most unskillfully taken out here from under the impending bluff. Further mining at this point would be dangerous indeed, but the seam might be opened at several new places.

At Burrel McCurdon's in S. 25, and on Fisher's Creek in S. 26, T. 10, R. 5 E., there are exposures of coal, but no mining has been done to show the thickness of the seam or the quality of the coal. On Line Creek in S. 8, T. 11, R. 5 E., there is a bed of coal of good quality eighteen to twenty inches thick at the out-crop; it will doubtless prove to be a good seam when properly opened. All these exposures are supposed to be the upper seam of the Sub-conglomerate Measures.

South of the head of Line Creek, the super-conglomerate strata cover up the conglomerate, which can only be traced south-westwardly by its out-crops near the top of the mountain.

Near the south-east corner of T. 10, R. 4 E., begins that valley of elevation which is known as Bristow's Cove and Murphree's Valley. Though designated by different names, it is undivided by nature and constitutes one continuous valley from this point to the lower end of Roup's Valley in Bibb county. This valley through the counties of Etowah and Blount is margined on the south-east by a high ridge of vertical strata, which has apparently served to protect this portion of the coal field from the excessive denudation to which the northern portion has been subjected. This portion of the coal field has been still further protected by being thrown into a synclinal trough between Roup's Valley and the great Cahaba fold. The Coal Measures have also thickened coming southward. The sub-conglomerate portion, which was barely 300 feet thick and carried only two seams of coal in the northern end of the field, becomes 700 to 800 feet in thickness and has four seams of coal. The super-conglomerate strata are presumed to have thickened proportionally; they at least have been protected and preserved, and present a great thickness of highly productive measures.

In T. 11, R. 4 E., but little mining has been done; only two beds, known as Turner's and Crump's, have been worked. The mountain is high and has a flat top; the little streams have not cut the coal seams, hence they have remained undiscovered. In section twenty-six of this township there rises the head spring of the Locust Fork of the Black Warrior River. It flows south-westwardly for six to eight miles, until it is joined by another prong which has run nearly as far from an opposite direction. After the confluence of the two streams, the river's course is north-westwardly across the remainder of the coal field and across Murphree's Valley, gradually turning again to the southwest, when it reaches the synclinal trough between Murphree's Valley and the Sequatchie fold.

The drainage of this portion of the mountain is evidently the same now as it was when it finally rose above the ocean. The immense intervening time and the softness of the shale of this region, have allowed great denudation. A broad valley or cove, with wide margins of rich bottom lands along the streams, is the result. The narrow gorge in which the river runs, after it crosses the valley, is a suggestive contrast.

This denudation by the head-waters of the Warrior River is principally in T. 12, R 3 E., and in the north-western corner of T. 12, R. 4 E. Many seams of coal are exposed in this region. Enough coal for home consumption is conveniently gotten from the beds of the streams, and hence it has not been sought for elsewhere. Those seams that have withstood denudation are generally the harder and thinner seams, while the softer and thicker out-crops have been swept away. The out-crops of these softer and thicker seams can be found on the higher grounds on the sides of the hills. Several of them were seen, but as they had not been cut and the survey was not provided with the means to cut them, no estimate could be made of their thickness or quality. Among the thin beds here exposed may be mentioned one which shows in several places in sections 19 and 20, T. 12, R. 3 E., from twelve to fourteen inches thick, of first class coal. This seam is covered by a heavy bed of solid fissile slate, filled with very beautiful ferns. Every cleavage of the slate reveals these ferns.

Near the eastern side of this township, in a wild region on Hurricane Creek, there was found a good seam of coal which measures from eighteen to twenty-four inches in thickness at the out-crop. This seam is of much interest; it is the first seam above the conglomerate rock and occupies the same Geological position as the great Sewanee Seam of the Cumberland Mountains, and gives evidence, from the thickness of its out crops, of being a thick seam.

It is underlaid by a great bed of slate which contains great quantities of *siderite* or *clay ironstone*. Some of this ore approximates *black band* in quality. This iron ore, existing thus along with the coal, may yet prove to be very valuable. Near the western side of this Township, several openings of coal seams have been made. One in the N. E. ¼ of S. E. ¼ of S. 8, by Green Carns, reveals a seam of good coal, three feet ten inches thick. This coal has a good reputation as a furnace coal. Two openings have been made at this point, on opposite sides of a hollow, with equally good results. The same seam has also been opened in the S. E. ¼ of S. 18, where it dips rapidly to the south-east, but it was not exposed well enough to be accurately measured; it, however, here approximates four feet in thickness. Near the S. W. corner of S. 17, an opening had been made in former years, but it is now filled up. From this bed a good deal of very excellent coal is said to have been taken. The coal of this bed is sixty-five feet below that of the *Carns' Bed*, and is said to be much thicker and of better quality.

These beds are of great importance, as they can be easily mined and the coal can be readily carried into the valley through an adjacent gap. Their situation very greatly enhances their value. These seams are marked on the section given hereafter as Nos. 3 and 4. The *seams* 1 *and* 2 of said section are also exposed south-west of here in S. 19 and in the S. E. ¼ of S. 24, T. 12, R. 2 E., just across the township line.

This last named quarter section, lying near the edge of Murphree's Valley, contains the head springs of both the Calvert and Blackburn prongs of the Little Warrior River. It also gives rise to a tributary of the Locust Fork. Two rivers and an affluent of a third, therefore rise here within one-quarter of a mile of each other, and flow off north and south and east from this prominent point. Eastwardly from this point runs the top of the water sheds of the Locust and Blackburn forks. The latter stream flows nearly south-west, at a mean distance of three miles from the edge of Murphree's Valley, till near the middle of Township 14, R. 1 E., when it turns in a north-westwardly direction and flows in this course to its junction with the Locust or main prong of the Warrior River.

Going westward along the water-shed of the Blackburn Fork of the Little Warrior River, many out-croppings are seen. In Township 13, Range 2 East, these exposures are too numerous to name. The Little River and all of its tributaries, have cut their channels deep enough to clearly show the structure of the country, and every stream exposes seams of coal. Dearmon's Creek, Sand Creek, Difficulty and Coal branches, flowing across the strata from the south-east, afford ample opportunities for studying and measuring the dip of the strata and for identifying the different coal seams existing in this coal field on its eastern side. Armstrong Creek and its branches on the western side of this coal field, reveal its structure between the river and the valley.

Gen. Gibson gives here a section across Raccoon Mountain Coal Field through T. 13, R. 2 E., showing perpendicular strata along the north-west edge of the coal field or between the coal field and Murphree's Valley, and twelve seams of coals, numbered from the uppermost one downward. It is to be regretted that we cannot reproduce this section. H. McC.

The dip of the strata in this field is, from the south-east base of the mountain to north-west of the river, a distance of four and one-half miles, averages about one foot in ten feet to the north-west; on to near the edge of Murphree's Valley, for two miles, the strata is nearly horizontal, i. e., the upper strata, the lower strata are unconformable and were dipping when last seen.

Just south-east of those which are vertical along the edge of the coal field, the strata, for a short distance, dip to the south-east at a high angle. A fault evidently exists here. but the amount of displacement could not be determined. The edges of several coal seams are here exposed; one of them is from three and one-half to five feet thick, but as their identity with any beds on the other side of the field is not clearly established, they are left unnumbered in the section. Probably they are *Nos.* 4 and 5 of that section with smaller intervening seams.

The coal seams *Nos.* 1 and 2 are found only on the north-western side of the river. They were both discovered by the Survey, and are probably the best seams of this coal field. *No.* 1 has about three feet in thickness of lustrous solid coal, free from sulphur. *No.* 2 is four feet thick and is apparently of excellent quality, but has not been sufficiently opened for a thorough examination. These two seams may belong to the *Upper Measures.* No Lepidodendrons or Uladendrons, which so profusely mark the *Lower Measures*, have yet been found in their included strata. *No.* 3 belongs evidently to the *Lower Measures*, it is rich in fossils. Though generally a thin bed, it thickens in places into a fine workable seam. It is not found south-east of the river. *Nos.* 4 and 5 are cut by the river in sections 14 and 22, and *No.* 6 in sections 28 and 33. *Nos.* 6 and 7 are exposed in Sand Creek, in section 27. *No* 7 is also exposed in Dearmon's Creek, in section 23. *No.* 8 is exposed on Hurricane Creek, as heretofore stated *Nos.* 7, 8 and 9, are seen on Difficulty and Coal branches. *No.* 9, however, is more fully shown in excavations and boring made by Mr. Caskie in sections 2, 3 and 10, T. 14, R. 2 E.; where it has three feet eight inches in thickness of solid coal of good quality. It is the first seam beneath the conglomerate, and dips here north-west one foot in seven feet. *Nos.* 10, 11 and 12, are only slightly exposed on the face of the mountain. *No.* 10 has, however, lately been opened and is said to be four feet thick.

About three-quarters of a mile from the foot of the mountain, in the bed of Canoe Creek, there was seen clear evidences of the existence of another seam of coal. It is therefore evident that the thickness of the *Sub-conglomerate Measures* is here about 800 feet, and this vast thickness of strata may be reasonably supposed to carry more than one workable seam of coal. The Coal Measures here rest on the *Sub-carboniferous limestone.* The dividing member is a calcareous shale, which gradually becomes more and more siliceous upward until it is a hard sand rock. Only in a few places could the base of the Coal Measures be seen; frequently it is beneath the level of the valley. The whole face of the mountain, which is from 600 to 700 feet high, is the Coal Measures. Above and back from this face of the mountain, if we take the dip of the strata as one foot in ten or 520 feet per mile, for a distance of over four miles, we find the depth of the coal measures at their thickest part to exceed 2,500 feet.

Usually coal fields yield one foot of coal for each fifty feet ef strata. The Raccoon Mountain Coal Field, so far as yet explored, shows only one foot of coal to the 100 feet of strata; it may therefore be expected that either it has many more seams than those discovered, or that the aggregate thickness of those already known will greatly increase on more extensive development.

In Township 13, Range 1 East, the south-east corner of which is in this coal field, several exposures of coal are to be found. One, in the south-east quarter of section 33, was discovered by the survey under Mr. Tuomey. His assistant, G. Powell, was directed to give a *bonus* of ten dollars for the discovery of a seam of coal four feet thick, and this one was found. It was dug through and measured four feet ten inches. The same seam has also been opened in S. 5, T. 14, R. 1 East, where it shows three feet of coal at the out-crop. In this township, there are many exposures of coal. In almost every section in the north-half of the township, coal is exposed either in the river or in the streams on each side of the river. Near the middle of this township is the divide between the waters of the Warrior River and Canoe Creek. South of this divide there are but few exposures of coal. The measures sink very perceptibly and the coal seams become thin and are too deep to be worked. The coal field terminates at the south-west end with a series of coves and with tilted strata of Sub-carboniferous and Silurian rocks piled up against its base.

This coal field, from its lower extremity to the upper end, opposite the head of Bristow's Cove, is a trough or canoe-shaped basin. It lies in a north-east and south-west direction, with its south-eastern side elevated about 200 feet above its north-western side, so that its greatest thickness or depth of strata is towards the north-western or Murphree's Valley side. The trends of its drainage channels conform to this structure. Perhaps a more apt illustration would be that it is in the shape of a flat-bottomed trough tilted to one side.

SPATHIC IRON ORE.—In many places over this coal field there are found thick beds of *Spathic iron ore*, apparently of good quality. This ore was first discovered by the survey in the N. ½ of S. E. ¼ of S. 27, T. 13, R. 2 E. An examination at this point found the bed to be fully ten feet thick, and to crop out for a distance of over a hundred yards on the side of the hill. It was also examined in section 33 of the same township, and was reported in section 28. The seam is therefore extensive.

The same class of ore was also examined in the S. E. ¼ of S. 24, T. 12, R. 2 E., where it was judged to be fully ten feet thick on the out-crop. It was seen in quantity also in sections 16 and 20, and was reported in S. 4, T. 12, R. 3 E. This ore is usually more easily reduced than *Hematite* or *Limonite*, and, although not so rich in iron, yet associated as it is here with the coal, its future value is assured.

IV. ANALYSES.

For convenience of reference, we have collected together and arranged in tabular forms, as given below, the analyses occurring throughout the body of this report.

I.—COALS AND COKES.

No.	Locality and Name.	County.	Specific Gravity.	Sulphur.	Moisture.	Vol'tile Combustible Mat.	Fixed Carbon.	Ash.	Pag.
1	Buttahatchie River, above Pierce's Mill	Marion.	1.372	.180	1.793	28.690	57.841	10.676	35
2	Bituminous Shale, near Mr. M. T. Akers'	"	1.432	.....	10.267	38.193	27.106	24.434	37
3	Thompson's Bed, in S. 5. T. 12, R. 11 W	"	1.252	.303	2.611	33.390	62.260	1.739	39
4	Woodruff Miles' Bed, in S. 22, T. 12, R. 11 W	"	1.271	.460	4.245	31.680	61.620	2.455	"
5	Burnette's Bed, in S. 1, T. 12. R. 12 W	"	1.102	1.730	3.694	35.380	58.517	2.409	"
6	Mineral Charcoal, Burnette's Bed	"	1.551	......	1.755	15.285	79.215	3.747	"
7	Bituminous Shale, in S. 16, T. 10, R. 7 W	Winston.	1.401	......	1.594	44.974	20.977	32.455	73
8	" " in S. 16, T. 14, R. 12 W	Fayette.	1.099	1.501	.286	75.688	7.284	16.742	114
9	Mrs Burton's Upper Bed. in S. 20, T. 14. R. 5 W	Walker.	1.318	3.070	2.052	38.078	55.265	4.605	152
10	Phillip's and Cordell's Bed, in S. 28, T. 14, R. 5 W	"	1.290	.649	3.098	34 552	60.745	1.605	157
11	Jas. Cole's Spring Branch Bed, in S. 21, T. 14, R. 5 W	"	1.261	.988	1.700	36.128	60.591	1.481	"
12	E. J. Phillips' Bed, in S. 22, T. 14, R. 5 W	"	1.268	.593	4.047	34.193	60.698	1.062	"
13	Bed in Fork, in S. 34, T. 13, R. 5 W	"	1.264	.548	2.081	31.951	64.337	1.631	"
14	Jagger's Bed, in S. 11, T. 13, R. 10W	"	1.44	.36	2.238	29.037	50.638	17.987	162
15	" " " " "	"	1.233	.574	3.091	20 044	56.537	11.328	"
16	Lost Creek, in S. E. ¼ of S. 30, T. 13, R. 9 W	"	1.315	.586	2.606	34 110	56.628	6.656	164
17	Guttery's Cave Hole, in S. 18, T. 14, R. 8 W	"	1.365	.687	3.332	30.683	52.762	13 223	171
18	Baker's Upper Bed, on Lost Creek	"	1.324	.695	6.355	31.086	60.665	1.894	172
19	" Lower " " "	"	1.285	1.331	2.578	35.164	59.348	2.910	"
20	Townly Bed, in S. 34, T. 13, R. 8 W	"	1.310	.710	3.007	29.084	63.352	4.557	175
21	" " " " "	"	1.450	1.744	2 960	26.162	44.516	26.362	"
22	Frog Ague Creek, in S. 8, T. 15, R. 6 W	"	1.451	.....	2.708	25.360	53.622	18.310	183
23	Mt. Carmel Bed, Upper Bench, S. 8, T. 15, R. 6 W	"	1.380	.586	2.213	28 987	56.454	12.355	184
24	" " " " " " "	"	1.352	.458	1.689	28.503	54.628	15.180	"
25	" " Lower " " " "	"	1.368	.566	1.782	25.873	57.509	14.836	"

26	Big Cane Creek, in S. 4, T. 15, R. 6 W	“	1.401	.482	3.799		26.217	57.316	12.668	185
27	Hawthorne Bed, in S. 4, T. 15, R. 5 W	“	1.333	.516	2.969		29.784	60.598	6.649	189
28	Upper Coal, in the S. E. ¼ of S. 24, T. 15, R. 6 W	“	1.339	trace	1.662		26.265	61.560	10.513	195
29	Horse Creek, in S. 24, T. 15, R. 6 W	“	1.365	.711	1.848		28.365	58.213	11.574	197
30	Robinson Bed, Horse Creek, in S. 26, T. 15, R. 6 W	“	1.371	.580	2.454		27.007	57.650	12.989	“
31	“ “ “ “ “ “ “	“	1.364	.599	2.703		26.600	56.367	14.330	“
32	Flat Creek, in S. 23, T. 15, R. 6 W	“	1.362	1.516	1.674		33.199	54.540	10.287	198
33	Beechy Hollow, in S. 6, T. 16, R. 5 W	“	1.439	.527	6.952		27.065	55.640	10.343	201
34	Corona, in S. 27, T. 15, R. 9 W	“	1.334	......	1.523		31.891	57.244	9.342	209
35	“ Lower Bench	“	1.303	.....	1.633		30.940	59.573	7.854	“
36	“ Upper “	“	1.359	......	1.776		32.541	55.615	10.068	“
37	“ S. 27, T. 15, R. 9 W	“	1.317	1.953	1.551		37.735	58.811	1.903	“
38	Coal Valley, in S. 19, T. 15, R. 8 W	“	1.320	......	1.319		32.674	56.598	9.409	220
39	Cane Creek, in S. 6, T. 16, R. 7 W	“	1.310	.728	2.261		33.782	57.002	6.955	232
40	Bradley Bed, in S. 26, T. 15, R. 7 W	“	1.278	.690	2 702		29.564	64.818	2 916	235
41	Mrs. Bailey's Bed, better part, in S. 20, T. 15, R. 7 W	“	1.339	.603	5.715		28.095	62.612	3.578	236
42	“ “ bony “ “ “ “	“	1.416	1.236	1.533		30.405	51.962	16.100	“
43	Brake's Bend, S. W. ¼ of S. 25, T. 16, R. 7 W	“	1.339	1.103	4.535		26.407	56.890	12.168	243
44	Van Hoose Lower Seam, Franklin Bend	“	1.331	1 137	1.903		23.873	56.207	18.017	245
45	“ Upper “ “ “	“	1.308	1.222	2.250		28.290	50.794	8.666	“
46	Franklin Bend, in S. W. ¼ of S. 16, R. 6 W	“	1.352	.507	6.004		28.840	59.958	5.189	248
47	Richardson's Lower Bed, S. 24, T. 17, R. 7 W	“	1.268	1.131	1.475		34.271	59.128	5.126	254
48	Thomas Bed, in S. E. ¼ of S. 23, T. 17, R. 7 W	“	1.280	1.506	1.442		27.211	66.000	5.347	“
49	Robinson's Lower Bed, in S. 26, T. 17, R. 7 W	“	1.336	.722	3.560		26.566	64.288	5.646	“
50	Richardson's Upper Bed, in S. 24, T. 17, R. 7 W	“	1.310	1.076	1.398		30.647	62.183	5.772	256
51	Warrior Coal and Coke Company Mines	Jefferson.	....	.56	.....		32.24	65.12	1.27	286
52	Coke of Warrior Coal and Coke Company's Coal	“	....	.61	2.55	....		93.86	2.98	“
53	Watt's Coal, Coke and Iron Company Mines	“	....	1.112	1.611		33.004	61.785	2.488	289
54	New Castle Seam, New Castle	“	1.38	.46	.50		28.24	59.69	10.92	300
55	Black Creek Seam, New Castle	“	1.29	.32	1.36		31.79	64.71	1.82	302
56	Pratt Seam, Slope No. 1, Pratt Mines	“	1.300	.918	1.501		31.485	61.598	5.416	318
57	“ Pratt Mines	“	1.29	.47	1.07		32.08	64.30	2.08	“
58	“ Coalburg Coal and Coke Company's Mines	“	1.323	1.696	.935		30.508	65.543	3.014	“
59	“ Drinking Branch	“	1.295	1.203	.855		30.745	65.075	3.325	“
60	“ New-found Creek	“	1.289	.824	.766		36.027	60.333	2.874	“

I.—COALS AND COKES.—CONTINUED.

No.	Locality and Name.	County.	Specific Gravity.	Sulphur.	Moisture.	Vol'tile Comb'stible Mat.	Fixed Carbon.	Ash.	Pag.
61	Coke, Pratt Mines	"	....	.57	.....	....	93.01	6.83	319
62	" "	"	....	.170	.....	....	91.163	8.667	"
63	Pratt Seam, Coalburg Coal and Coke Company's Mines	"	....	1.022	.....	32.169	63.369	3.341	324
64	" Upper Bench, Slope No. 1	"	1.330	1.224	1 474	32.288	59.503	6.735	344
65	" Lower " " "	"	1.278	.612	1.529	30.683	63.683	4.102	"
66	" Slate Parting " "	"	1.988	......	1.621	11.719	23.839	62.821	"
67	Cal. Williams' Lower seam of upper group	"	1.391	.521	4.175	22.415	62.482	10.928	355
68	" Main bench of lower group	"	1 312	.604	1.525	26.170	66.020	6.285	"
69	Coal Creek, in S. 26, T. 16, R. 5 W	"	1.351	1.525	1.850	27.561	61.696	8.89	367
70	Fork Shoals, in S. 29, T. 17. R. 6 W	"	1.325	.79[illegible]	4 976	27.169	62.135	5.720	368
71	Coal Cave Hollow, in S. 30, T. 17, R. 6 W	"	1.330	1.945	1.258	26 253	59.896	12 594	369
72	Near Wetona P. O., in S. 4, T. 19, R. 6 W	"	....	......	......	26.55	71.28	2.10	389
73	So-called *Cannel Coal*, from S. 30, T. 20 R. 8 W	Tuscaloosa.	1.348	2.752	.830	36.207	48.319	14 644	449
74	Manly Coal Bed, in S. 1, T. 21, R. 9 W	"	1.277	.752	2.004	33.833	61.872	2.291	484
75	University Mines, in S. 2, T. 21, R. 9 W	"	1.298	1.038	1.833	36.233	54.534	7.400	488
76	Prude's Lower Mine, in S. 22, T. 21, R. 9 W	"	1.327	.626	5.426	31.952	59.455	3.167	500
77	Chambers' Mine, in S. 10, T. 21, R. 9 W	"	1.281	2.380	1.838	30.682	64.339	3.141	"
78	*Double Seam*, in S. 21, T. 20, R. 9 W	"	1.304	2.129	1.810	34.029	58.240	5 921	513
79	*Block Coal*, in S. 27, T. 20 R. 9 W	"	1.411	1.613	2.239	34.606	50.375	12.780	515
80	Jas. Beaver's Coal, in S. 13, T 20, R. 9 W	"	1.311	.660	2 513	31.977	60.033	5.477	522
81	Prince Christian's Coal, in S. 14, T. 19, R. 9 W	"	1.317	.608	2.179	32.855	59.820	5.146	526
82	Panther Branch, in S. 7, T. 19, R. 8 W	"	1.329	.835	.778	33.271	61.082	4.869	527
83	On Blue Creek, in S. 32, T. 18, R. 8 W	"	1.282	.798	2.391	33.865	59.069	4.675	528

II. *Ash of Coke and Slate Parting of the Pratt Seam.*

	(1)	(2)
Silica	93.370	63.155
Ferric Oxide	1.152	6.383
Alumina	3.510	22.884
Lime		.703
Magnesia		.536
Potash		2.164
Soda		1.143
Phosphoric Acid	.032	2.564
Sulphuric Acid		.145
Sulphur, combined	.858	.051
Chlorine		trace.
	98.922	99.728

Analysis (1), ash of the *Coke* 62 of the above table.

Analysis (2), ash of the *Slate Parting* 66 of the above table.

III. *Fire Clays.*

	(1)	(2)	(3)
Specific Gravity	2.398	2.550	....
Hygroscopic Moisture	1.344	1.189	....
Combined Water	4.728	13.057	......
Silica	67.544	47.197	60.805
Alumina	20.523	37.756	21.435
Ferric Oxide	2.282	.906	4.888
Lime	0.000	trace	....
Sulphuric Acid	trace	0.000	....
Undetermined and Loss	3.579	....	12.872
	100.000	100.105	100.000

No. (1). Underbed of a coal seam.

Locality:—S. 2, T. 9, R. 14 W., on Bull Mountain Creek, Marion county.

No. (2). "The Chalk Bluff."

Locality:—S. 7, T. 10, R. 12 W., near Chalk Bluff Post-office, Marion county.

No. (3). Underbed of a coal seam.

Locality:—S. E. ¼ of S. 36, T. 16, R. 8 W., Walker county.

IV. Clay Iron-stones.

	(1)	(2)
Specific Gravity	3.465	3.309
Silica.	7.252	15.215
Carbonate of Iron	57.200	54.352
" " Magnesia	7.500	......
" " Manganese		.837
" " Lime.	1.307	2.647
Manganese	trace	....
Peroxide of Iron	8.338	6.951
Alumina	11.142	8.592
Phosphoric Acid	.416	1.422
Undetermined Water, etc	6.845	9.984
	100.000	100.000

No. (1). A nodule with thin seams or streaks of pyrites of a metallic luster before weathering, but which becomes on weathering surrounded by a white coating of copperas.

Locality:—S. E. ¼ of S. W. ¼ of S. 33, T. 9, R. 10 W., Winston county.

No. (2). A gritty *iron stone* in thin interstratified seams in shale.

Locality:—Robinson's Coal Bed, in the S. E. ¼ of S. 21, T 14, R. 8 W., on Lost Creek, Walker county.

An other nodule, very similar to *No.* (1) and from the same locality as *No.* (1), gave the following analysis:

Specific Gravity	3.563
Hygroscopic Moisture	.967
Water in combination	1.437
Silica	3.209
Sesquioxide of Iron	7.918
Protoxide of Iron	42.082
Alumina	4.046
Oxide of Manganese	.186
Lime	2.418
Magnesia	3.486
Phosphoric Acid	.341
Sulphur	.317
Carbonic Anhydride	31.908
	100.315
Metallic Iron	35.000
Phosphorous	.149

V. *Calcareous Rocks.*

	(1)	(2)	(3)
Specific Gravity	2.684	2.544	2.713
Silica	60.399	71.349	17.272
Carbonate of Lime	25.553	11.703	74.140
" " Magnesia	.652	1.503	2.267
Peroxide of Iron	4.345	2.702	1.863
Alumina and Phosphoric Acid	3.057	3.865	1.271
Undetermined and Loss	5.994	8.878	3.187
	100.000	100.000	100.000

No. 1. Locality:—R. D. Blachwood's Spring, N. E. corner of S. 12, T. 15, R. 8 W., Walker county.

No 2. Locality:—Jas. J. Odom's field, S. W. ¼ of S. 16, T. 16, R. 7 W., Walker county.

No. 3. Locality:—Franklin's Bend, S. E. ¼ of S. W. ¼ of S. 19, T. 16, R. 6 W., Walker county.

VI. *Millstone Rock.*

Specific Gravity	2.583
Hygroscopic Moisture, at 100° C.	.195
Combined Water	.511
Silica	91.309
Ferric Oxide	3.802
Alumina	2.504
Lime	trace.
Sulphuric Acid	"
Undetermined and Loss	1.679
	100.000

Locality:—Millstone Mountain, in S. 29, T. 11, R. 9 W., Winston county.

VII. *Limonite of the Drift.*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Specific Gravity	3.325	3.217	3.369	3.421	3.461	3.392	3.111
Hygroscopic Moisture	1.571	2.365	1.716	1.777	1.468	3.843	......
Combined Water	10.241	4.399	6.803	12.466	12.372	8.155	....
Silica	17.467	34.744	3.233	4.371	4.867	4.506	23.475
Sesquioxide of Iron	61.203	47.644	82 301	78.285	80.053	81.183	50.88
Alumina	5.530	9.001	.713	.760	.221	1.341	14.081
Oxide of Manganese	1.016	.340	4.61	0.000	.188	0.073	.....
Lime	0.000	0.000	trace	.809	.407	0.298	......
Magnesia	......	....	....	.391	.045	.032	.....
Phosphoric Acid	.347	.133	.467	.615	.624	.268	.324
Sulphur	trace	trace	trace	.120	.085	.138	.....
Undetermined and Loss	2.625	1.374	4.216	.398	.170	.173	11.232
	100.000	100.000	100.000	100.000	100.000	100.000	100.000
Metallic Iron	42.842	33.351	57.674	54.80	56.037	56 821	35.622
Phosphorous	.152	.058	.204	.268	.272	.117	.140

Locality of No. (*1*):—N. W. ¼ of S. 20. T. 9, R. 11 W., Marion county.
" " " (*2*):—S. 32, T. 9. R. 11 W., Marion county.
" " " (*3*):—Sections 32 and 33, T. 12, R 13 W., Marion county.
" " " (*4*), (*5*) *and* (*6*):—S. 20, T. 15, R. 15 W., near Vernon, Lamar county.
" " " (*7*):—S. E. ¼ of S. 19, T. 14, R. 20 W., Fayette county.

APPENDIX.

The following statement is of the Receipts and Disbursements of the Appropriations for the Geological Survey, during the fiscal years 1882-3 and 1883-4. As required by law, these accounts, with accompanying vouchers, have been submitted to the Governor at the end of each quarter; they have received his approval, have been examined and found correct by the Auditor, and are now on file in his office.

GEOLOGICAL SURVEY OF ALABAMA,

In account with Eugene A. Smith, State Geologist,
for the Fiscal Years 1882-3 *and* 1883-4.

1883	1882-3	Dr.	Cr.
Mar. 31	By check of State Treasurer..............	$	$ 1,000 00
	To balance brought over from preceding account...........	55 63	
	Express on $1,000 to Tuscaloosa.. ...	1 50	
	Expenses in Montgomery, while on Survey business.	3 35	
April 1	Expense in returning to Tuscaloosa......	2 85	
2	Paper for Manuscript.	1 75	
3	Subscription Journal Academy Natural Sciences 1882, $5.00, and P. O. order 10c	5 10	
22	Spectroscope $25.00, check 10c, express charges 45c	25 60	
May 5	Postage stamps.....................	4 00	
14	Book of blank book check...	1 50	
15	By cash from State Treasurer		1000 00
18	To express charges on money from Montgomery to Tuscaloosa	1 50	
	Julius Bien, for maps and illustrations of Geological Report..........	374 25	
	By cash refunded for error in checks.......		40
22	To postage stamps......................	3 00	
	Express on fossil specimen......	1 50	
26	A. R. McCntchin, expenses of trip made sor Survey.....	17 00	
31	Expenses of trip to Washington for consultation with Director of U. S. Geological Survey	83 50	
June 5-9	Buckles and hat.............	2 30	
10	Express on specimens.................	1 60	
16	Express on specimens...	1 35	
23	Cap paper..........	2 50	
25	Henry McCalley for making twenty-five analyses at $5.00 each.................	125 00	
28	5000 labels	4 00	
	Amount carried forward	$ 718 78	$ 2,000 40

1883.		1882-3.	Dr.	Cr.
		Amount brought forward.........	$ 718 78	$ 2,000 40
July	3	To John Boyle, for two tents and camp outfits and freight on same	44 00	
	3	Express on Fire Clay specimens..... ..	1 50	
	8	By cash from State Treasurer..............		1000 00
	12	To express on Maps of Alabama from Montgomery	65	
		Postage stamps and postals............	5 00	
	17	Express on specimen..................	35	
	26	Cap paper for manuscript........... ...	85	
	27	Aneroid Barometer and express on same..	20 50	
	30	One Concord Hack, with extra fittings, and express charges to Tuscaloosa	337 45	
		One Studebaker Hack, with extra fittings, and express charges to Tuscaloosa	283 00	
Aug.	6	Advertisement for mules	1 50	
	.7	Telegram and express on specimen......	3 35	
		By cash from State Treasurer		1000 00
	9	To express charges on money from Montgomery	1 50	
		Postage stamps.......	4 00	
		Bill of stationery, Alston & Fitts...	11 50	
	10	Express on specimen	45	
	13	Blacksmith work: mules shod, tent pins, etc.........	9 75	
		Saddle, collars and repairs of harness....	8 10	
	14	Cloth and mosquito netting	1 65	
	15	Bill of supplies, J. P. Turner & Son......	18 58	
		Advertisement for mules, provisions and towels	8 50	
	18-20	Provisions and traveling expenses and collecting of specimens	3 90	
	30	Camp table and camp hardware (ovens, etc)	6 30	
Sept.	7	Expenses, Prairie Bluff to Montgomery and in Selma	8 10	
		Freight on boxes of specimens....	2 00	
	8	One day in Montgomery....	2 50	
	15	Seven days expenses	7 63	
	17	Express on manuscript and several packages of specimens	3 90	
		Expenses, Blount Springs to Tuscaloosa	3 00	
	19	Mucilage and post office stamps....	1 25	
	24	Express charges on manuscript, proof sheets and barometer	1 00	
		Electrotyper for illustrations of Report..	1 00	
	35	Bridge toll and provisions.............	1 00	
	26	Freight on specimens...	50	
	29	Two bushels of corn, oil can and also oil.	1 95	
	30	Theoph. Miller for hire of two mules two months, August and September.......	36 00	
		Frank Burns, salary for four and three-fourths months, May to Sept. inclusive.	475 00	
		Frank Burns, for expenses in collecting for Survey, May to September inclusive	200 75	
		J. Jemison, collecting and other work for Survey, March to September inclusive.	40 00	
		Amount carried forward....	$ 2,873 74	$ 4,000 40

1883.	1882-3.	Dr.	Cr.
	Amount brought forward	$ 2,873 74	$ 4,000 40
Sept. 30	To Joseph Squire, salary, (Survey of Cahaba Coal Field) 4 mo. June to Sept. inclusive	600 00	
	Joseph Squire, expenses, June-Sept., and provisions, work and express on money	163 85	
	A. M. Gibson, salary, (Warrior Coal Field) 3 mo. June to Sept. inclusive	225 00	
	Post office order for money sent A. M. Gibson	75	
	Henry McCalley, salary two months, August and September	250 00	
	Henry McCalley, traveling expenses, teams, etc., August and September	120 70	
	Eugene A. Smith, salary four months, from March to September inclusive	800 00	
	By cash from Treasurer on acc't of salary		800 00
	To B. H. Hardaway for indexing and work in Laboratory	4 00	
	Anderson Moore, wages cook and driver 37 days at $20 per month	25 00	
	Boat trip, Tuscaloosa to Prairie Bluff, undertaken at joint expense of U. S. and Ala. Geological Surveys, Aug. 14 to Sept. 30.		
Aug. 14	To provisions and medicines	5 85	
15	Hardware, oil, etc., J. Snow & Co's Bill	28 00	
	Bill of provisions, W. S. Howell & Co	13 45	
	Bil of provisions, G. A. Searcy & Co	89 44	
18	Tin ware and provisions, Eutaw	5 80	
20	Oil, white lead, ect., for repairing boat roof	4 55	
21	Expenses of workman, Tuscaloosa to Eutaw and back, repair of boiler	2 85	
	Personal expenses Eutaw to Tuscaloosa, and to boat at Finch's Ferry	4 75	
23	Wood and provisions	8 00	
24	Wood	3 50	
25-31	Wood for boiler, seven days	30 00	
31	Supplies purchased in Mobile	5 75	
Sept. 5	Wood for boiler Sept. 2-5, six cords	12 00	
6	Provisions purchased by Anderson Moore Aug. 16 to Sept. 6, and nails	21 60	
17	Workman for repairs on boiler	5 00	
18	Rope and Block	11 40	
19	Provisions purchased for boat by A. Moore, Sept. 6-19	12 80	
	Anderson Moore, wages as cook, Aug. 14 to Sept. 19	25 00	
21	R. Barbour, expenses Demopolis to Tuscaloosa and return	11 80	
30	Capt. Bartee, salary, Aug. 13 to Sept. 28.	150 00	
	" " for money paid pilot on Alabama River	30 00	
	Capt. Bartee, for money paid for boat expenses, Sept. 6 to 28	25 15	
	Capt. Bartee, for money paid for wood, Sept. 2 to 28	64 70	
	Amount carried forward	$ 5,034 43	$ 4,800 40

1883.	1882-3.	Dr.	Cr.
	Amount brought forward	$ 5,034 43	$ 4,800 40
Sept. 30	To R. Barbour, wages as engineer for Aug	50 00	
	" " " " Sept.	50 00	
	Jake Saunders, wages Aug. 13 to Sept. 30	29 10	
	Wilson Tucker, wages Aug. and Sept.	33 60	
	Harry Hinton, wages Sept	10 80	
	Rent of boat, Aug. 10 to Sept. 30	52 10	
	By items charged by error in bill of J. Snow & Co		3 30
	Cash refunded by U. S for one-half expenses of boat trip to Sept. 30		396 85
	By balance carried over		59 48
	Total	$ 5,260 03	$ 5,260 03
	1883-4.	Dr.	Cr.
	To balance brought over	$ 59 48	$
Oct. 1	To express on manuscript and to postage stamps	2 35	
2	Freight on fossil coal plants from LaGrange	15 55	
	Blacksmith work, shoeing mules, ironing of feed boxes, etc	4 75	
3	Hauling of Geological specimens from wharf	2 50	
	Tin cans fitted to mess chest	3 50	
	Cooking Utensils for camp	4 55	
	Bill of provisions purchased for camp, J. C. Turner & Son	16 70	
4	Freight on box: hitch chain, candle sticks, and etc., for camp	2 45	
	One bushel of corn and four doz. bundles of oats	2 05	
	Harness, (two sets), and repair on saddle	27 05	
Oct. 10	Am't paid out for forage and provisions, October 5-10	7 00	
15	Am't paid out for forage and provisions and camp expenses, October 11-15	16 75	
30	Am't paid out for forage and provisions, October 16-30	35 95	
31	Freight on cases of acids for Laboratory	22 10	
	Hire of two mules, October..	20 00	
Nov. 5	Exp'ss on Specim'ns, and to postage sta'ps	3 70	
10	Chemical Analytical Balance	75 00	
	Repair of barometer	2 60	
14	Express on several packages of specimens	3 80	
	By cash from State Treasurer		1,000 00
	To express charges on money from Montgomery to Tuscaloosa.	1 75	
17	A. M. Gibson's salary during October and up to date	20 80	
	Frank Burns' salary during October and up to date	35 20	
	Eimer & Amend, bill of chemicals and apparatus, and exchange.	131 92	
	Hauling of Geological Specimens from wharf to mine	4 75	
	Postage stamps	2 00	
30	Anderson Moore, wages as cook and driver October 1 to November 15	30 00	
	Amount carried forward	$ 554 31	$ 1,000 00

1883.		1883-4.	Dr.	Cr.
		Amount brought forward	$ 554 31	$ 1,000 00
		Balance of account of Boat Trip undertaken at the joint expense of U. S. and Alabama Geological Surveys		
Nov.	8	To Capt. Bartee, balance on wages as pilot to date	60 00	
		R. Barbour, balance on wages as engineer to date	41 66	
		Wages of boat hands, &c., as per vouchers in Auditor's Office	29 45	
		Balance on rent of boat, Oct. 1 to Nov. 7.	31 25	
		By cash from sale of rope and tackle.		5 00
		refunded by United States Survey for one-half expenses		78 68
Dec.	7	To hire of two mules for McCalley, October 1 to December 20	48 00	
	8	Package of postals, and express on manuscripts four times	1 50	
		Express on box of fossils from S. C. Johnson	5 00	
		Am't paid Duncan Thomas, driver of ambulance	5 00	
		B. H. Hardaway, clerical work, making Index to Report	12 50	
	24	Case for Analytical balance	15 00	
		Postage stamps	2 00	
	31	Henry McCalley, salary first quarter, October, November, December	375 00	
		Jos. Squire, salary during October, November and December, including exchange, $381.36	200 75	
1884				
Jan.	5	To Letter copying book	2 50	
	12	By Cash from State Treasurer		1,000 00
	12	To Express on money from Montgomery to Tuscaloosa	1 95	
		Freight on boxes of Specimens	3 25	
	16	Express on Specimens; telegram and memorandum	1 25	
	19	Hotel bill of E. A. Smith and H. McCalley while on Survey business	6 30	
	21	Express on Geological Reports from Montgomery to Tuscaloosa	2 45	
	22	Stamps for distribution of Geological Reports	18 50	
	30	Ball of twine and Express on several packages, Reports and Specimens	6 60	
Feb.	2	D. W. Langdon, Jr., Salary for January	50 00	
	6	Postage stamps	1 00	
	7	Freights on Maps for Geological Report from New York to Montgomery	5 08	
		Purchase and printing 1,000 labels and 200 postal cards	3 50	
	11	Freight on two boxes, Reports from Montgomery to Tuscaloosa	5 75	
		Express on box of Mineral Specimens	3 00	
	12	Stamps for distribution of Geological Reports	16 20	
	18	Collection of Mineral Specimens	15 25	
		Postage stamps for distribution of Report	5 75	
		Amount carried forward	$ 1,529 69	$ 2,083 68

1884.		1883-4.	Dr.	Cr.
		Amount brought forward..........	$ 1,529 69	$ 2,083 68
Feb.	26	To D. W. Langdon, Salary for February...	50 00	
Mar.	1	Postage stamps for distribution of Report	9 00	
	8	Two telegrams about Survey business..	75	
		Express and cartage of two boxes Specimens and one box Reports..........	5 85	
	16	Expense going to Birmingham—Survey business......	4 10	
	17	Postage stamps for distribution of Report	10 50	
	24	Express on box of phosphates, and item omitted in Barbour's account	1 70	
	31	Henry McCalley, part pay of Salary, second quarter, January and March.......	200 00	
		Jos. Squire, salary for work done January and March, and exchange	150 50	
April	1	Freight and cartage on fossil specimens..	1 25	
		Postage stamps.	3 00	
		Printing of circulars and bristol board...	90	
		Bottles for soil specimens.....	1 00	
		Express charges on phosphate specimens	1 00	
	2	Subscription (1883) Academy Natural Scientific Journal and P. O. order	5 08	
	5	A. M. Gibson for work done in March and P. O. order for same	25 15	
		D. W. Langdon, salary for March.......	50 00	
	14	D. W. Langdon for travelling expenses .	16 60	
		Express charges on barometer, vouchers and specimens	3 05	
	17	Freight and hauling of specimens and one telegram	1 50	
	20	Expenses of trip to Birmingham.	4 50	
	26	" " " " Hamburg	7 70	
	28	1,000 labels.....................	1 25	
	29	Delivery of express package........	10	
		Postage stamps...........	5 25	
	30	By cash from State Treasurer......		1,000 00
	30	To express on money from Montgomery to Tuscaloosa.....	1 50	
May	1	D. W. Langdon, salary for April and P. O. order for same	50 15	
		D. W. Langdon for travelling expenses as per account rendered	50 00	
	6	Printing bill heads, labels and circulars .	2 70	
	7	Two telegrams	90	
	8	Express and delivery of specimens	80	
	10	Jos. Squires' salary and express on money to Halena.....	300 75	
	11	Three telegrams...............	75	
	12	Express on box of phosphates and marl..	85	
	14	B. H. Hardaway for copying map........	8 00	
	15	Two telegrams	95	
	18	Expenses to Hamburg	7 05	
	19	Express and cartage on boxes specimens	1 30	
	20	Expenses of trip to Birmingham........	2 70	
	30	Express delivery of three packages of specimens....	30	
		John Daniel. trip to Dallas and Autauga counties (phosphates) as per account rendered.........	16 70	
		Postage stamps...............	5 00	
June	2	Stationery (Fitts Brothers)	5 90	
		Amount carried forward..........	**$ 2,546 72**	**$ 3,083 68**

1884.		1883-4.	Dr.	Cr.
		Amount brought forward..........	$ 2,546 72	$ 3,083 68
June	5	To D. W. Langdon, salary for May	45 25	
	9	Boxes for specimens	4 00	
	25	Postal cards and stamps	1 75	
	28	Express and delivery of nine packages of specimens	3 10	
	30	Henry McCalley, balance on salary second quarter..............	175 00	
		Henry McCalley, balance on salary in part, third quarter........	100 00	
		Henry McCalley, balance on travelling expenses while engaged in field work, as per itemized eccount rendered.... .	184 72	
		Letter heads and rubber stamp (Fitts Bros)................	5 50	
		J. Snow & Co., glue and twine..........	85	
July	4	Expenses of trip to Livingston..........	2 60	
	9	Express on accounts and vouchers, third quarter.......:	25	
	10	Postage stamps....	2 00	
	12	By cash from State Treasurer..............		1,000 00
		To express on money from Montgomery ...	1 75	
	15	One camp cot and P. O. order.....	2 85	
		Book of blank checks.	35	
	22	Joseph Squire, salary and expenses, work in Cahaba field	125 00	
		Express on money sent Jos. Squire......	30	
		John Daniel, salary and expenses for examining phosphates, marls—itemized account rendered..................	50 25	
	26	Postage stamps.....	2 00	
	30	Express on packages during July.... ...	3 45	
Aug.	2	Box rubber bands	2 50	
		Nat Lawson, shoeing mules.	3 00	
	4	Jas. Craddock, work in Laboratory on phosphates.......	19 00	
		Express on package to Dr. Webb.......	25	
	5	Advertisement for mules..	1 50	
		Axle oil, pans and groceries.	1 45	
	6	J. Snow & Co., hardware for camp......	1 90	
	7	Postage stamps..............	2 00	
		J. McGahey, repairs on harness and saddles	2 25	
		A. M. Gibson for work done during July, and P. O. order....	50 25	
	18	Maximum thermometers and express on same....	6 05	
	20	Camp expense, provisions and forage, August 1-20	4 95	
	29	Four telegrams sent during August	1 50	
		Express on several packages during August..............................	3 90	
	30	Anderson Moore, wages as cook and driver, July and August.......	25 00	
Sept.	6	Letter heads and printing same.........	5 25	
		Chest for Geological ambulance	4 50	
	17	Postage stamps and postals	2 50	
	21	500 sheets cap paper for maduscript. ...	75	
		Amount carried forward..........	$ 3,396 19	$ 4,083 68

1884.	1883-4.	Dr.	Cr.
	Amount brought forward	$ 3,396 19	$ 4,083 68
Sept. 22	To Two telegrams	1 25	
23	Express on two boxes phosphates	85	
27	Postage stamps.	2 00	
	Cost of diamond drill	400 00	
30	Joseph Squire, for work in Cahaba field, as per itemized account rendered	280 00	
	Eugene A. Smith, five months salary as State Geologist	1,000 00	
	By cash from State Treasurer on account of salary		1,000 00
	To balance carried over	3 39	
	Total	$ 5,083 68	$ 5,083 68

NOTES.

We would draw special attention to the fact, as stated under Tuscaloosa county, that we now firmly believe that our given "*General Section of the Strata above Drainage Level of the Coal Measures of the Warrior Field in Jefferson county,*" is entirely wrong above (31) and that this erroneous or upper part of the *General Section* under Jefferson county, ought to be similar to the portion between (31) and (45) of the "*General Section of the Strata of the Coal Measures above Drainage Level in Tuscaloosa county.*" We reached this conclusion after a careful study of the Coal Measures of Tuscaloosa county, and are strengthened in our belief by the fact that this General Section under Jefferson county, thus altered, corresponds closely to our original general section of the Coal Measures of Jefferson county, which we changed just before going to press, because we could not verify it in the southern part of the county. *Our present "General Section of the Strata above Drainage Level of the Coal Measures of the Warrior Field in Jefferson county,"* is, therefore, the part below (45) of our "General Section of the Strata above Drainage Level of the Coal Measures in Tuscaloosa county."

The above change in our *General Section* alters our estimate, on page 318, of the area of the *Pratt Seam* in Jefferson county, from nearly 100 square miles to at least 150 square miles, and perhaps to as much as 200 square miles, for this seam of coal may cover most of the area between Village and Rock creeks.